IBM Maintenance Library

6746 Selectric® System/2000 Wheelwriter® 3 Typewriter

6747 Selectric® System/2000 Wheelwriter® 5 and 6 Typewriters

6747-2

S544-4047-5

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GENERAL INFORMATION

This chapter contains general information about the contents of this maintenance library. The text that follows describes each chapter and, in some cases, explains how to use the information in the chapter.

You will find a list of the tools and test equipment you will need to service this machine at the end of the chapter.

CHAPTER 2, DIAGNOSTIC INFORMATION

The diagnostic information contains the procedures you will use to diagnose and isolate product failures. Diagnostic information consists of:

Start
Start of Call
Procedures
Diagnostic Aids
Verification Tests

- START: Start is the starting point for any diagnostic action you take to determine a failure in this machine. This product has three levels. Therefore, you must determine which machine level you are servicing before you start the diagnostic procedures. The START page will help you determine the machine level and send you to the appropriate Start of Call.

- START OF CALL: The start of call checks out each area of the machine. When you reach a failure the start of call sends you to the diagnostic procedure to use to isolate the failure.

  Any time the machine displays an error indication LED or LEDs, even if you have already started a diagnostic procedure, go to the Error Indications Diagnostic and take the appropriate action. If another error LED pattern starts to flash before you have diagnosed the first one, try to determine the failure of the first one before going to the second.

- DIAGNOSTIC PROCEDURES: When the Start of Call sends you to a diagnostic procedure, go to that page and perform the steps as instructed. If there are any notes or instructions at the top of the page you must read them before you start the procedure.

  Carefully read each step of the procedure and perform the appropriate action as instructed. If you do not remember the location of a specific part or test point, or if you do not remember an adjustment or removal procedure, see the chapter that has that information. Always return to the diagnostic procedure after you do this. In some cases you will be sent to other diagnostic procedures to find the failure.

  Failing Parts or Assemblies - The diagnostic procedures will generally help you diagnose a problem to one part or assembly. The last step of the specific procedure you are using will indicate a part or assembly is failing. You should inspect the part or assembly before you decide to replace it. It may only be loose or dirty or need only a small repair action.

The diagnostic procedure may lead you to 2 or even 3 possible failing parts or assemblies (Figure 1). The parts that may be failing are listed in order of the most probable failure. In the example shown below, the printer board is most probably the cause of the problem.

The PRINTER BOARD is failing.
or
The FUNCTION BOARD is failing.

Figure 1, Failing Parts or Assemblies

Measuring Voltages - Many of the diagnostic procedures instruct you to measure voltages on cable plugs and electronic board connectors. If you are asked to measure voltage at several places on a plug or connector, a chart next to or near the question will indicate the number of the plug or connector, the pin numbers you should measure, the signal name, and the correct voltage for the condition you are measuring. Measure the voltage only at the pins listed in the chart. A ground point may be specified. If it is not, and the machine is a level 1, use the keyboard ground wire for the common meter lead. If the machine is a level 2 or 3, use the printer board bracket mounting screws, or the function board mounting screws for the common meter lead.

Remember to set your meter on the correct scale and put the meter leads in the correct position for the voltage you are asked to measure.

Matrix Diagnostic - When there could be multiple symptoms for a failure, or multiple failures that could cause the same symptom, you will be sent to a matrix diagnostic (Figure 2). In general, the matrix diagnostic will help you locate mechanical failures. In some cases you will be sent from the matrix to an electrical diagnostic if there is no mechanical failure. The left side of the matrix lists the symptoms. The right side of the matrix, Sequence of FRU Checks, lists the FRUs in the order you should check them. The FRU most probably causing the indicated symptom is placed first in the sequence. The letters in the sequence of FRU checks send you to the part or assembly you need to check. These parts and assemblies are listed in the FRU CHECK procedure directly below the matrix.

SYMPTOM	SEQUENCE OF FRU CHECKS 1	2
Printwheel does not rotate, is noisy, or its speed changes as it rotates.	B	A
Typewriter malselects, splits characters, or makes print hammer marks.	B	A
Carrier drives against right side frame.	A	B
Print hammer does not energize.	A	B

FRU CHECKS	CHECK FOR
A Selection Plate Assembly	Motor: Binds, loose screws, and loose connector Hub: Bent, broken, or loose Hammer: Binding or excessive end play If the hammer solenoid does not energize, GO TO the Print Hammer Electrical Diagnostic, page 2-66. Electrical failures. GO TO the Selection Electrical Diagnostic, page 2-85.
B Printwheel	Binds, broken or missing bias spring, broken cartridge, bent printwheel petals Electrical failures. GO TO the Selection Electrical Diagnostic, page 2-85.

Figure 2, Matrix Diagnostic

- DIAGNOSTIC AIDS: This section contains information outside the diagnostic procedures to help you diagnose a failure of a specific part. Some diagnostic aids are contained in the machine.

- VERIFICATION TESTS:

This section contains the Power on Reset (POR) Sequence of the machine. The machine performs the POR each time it is turned on. You will use this information throughout the diagnostic procedures. You should become familiar with the POR and be able to determine if the machine performed all the steps.

CHAPTER 3, REPAIR INFORMATION: This chapter contains:

- Adjustments
- Removals and Replacements
- Packaging/Handling Procedures

CHAPTER 4, PARTS/TEST POINT LOCATIONS: This chapter is useful when you are asked to measure voltages. Use this information to help you locate parts such as electronic boards, connectors, pin numbers and test points.

CHAPTER 5, PREVENTIVE MAINTENANCE: This chapter contains the Lubrication Guide for this machine.

CHAPTER 6, SAFETY INSPECTION GUIDE: Use this information to inspect a machine for safety problems before putting the machine under a Maintenance Agreement.

CHAPTER 7, PARTS CATALOG: This catalog includes figures, part numbers, and part names.

CHAPTER 8, FIELD DIAGRAMS: Use these diagrams to trace circuits and logic flow.

TOOLS AND TEST EQUIPMENT

Meter readings in this manual were taken with an IBM meter, P/N 9900167.

IBM CEs, IBM CSRs and Dealer Technicians should use the following tools to service this machine.

• 6" Metal Scale	P/N 450158
• Push-Pull Scale	P/N 460870
• 3/16" x 6" Flat Blade Screwdriver	P/N 1650853
• 5/16" x 6" Flat Blade Screwdriver	P/N 1650856
• Metric Feeler Gauge	P/N 1749245
• #1 SUPADRIV[1] Screwdriver	P/N 4760541
• #2 SUPADRIV Screwdriver	P/N 4760542
• #1 SUPADRIV Screwdriver, insulated	P/N 4056724
• #2 SUPADRIV Screwdriver, insulated	P/N 4056726
• 5/16" x 1/4" Open End Wrench	P/N 9900005
• Large Springhook	P/N 9900059
• Medium Screw Starter	P/N 9900060
• T-Bender	P/N 9900094
• Analog VOM (Triplett[2] 310C or equivalent)	P/N 9900167
• 3/8" x 7/16" Box End Wrench	P/N 9900182
• Large Screw Starter	P/N 9900328
• Feeler Gauge	P/N 9900468
• Wrap Plug	P/N 1341046
• ESD Handling Kit	P/N 6428316
• ESD Wrist Band, Small	P/N 6428167
• ESD Wrist Band, Large	P/N 6428169

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[1] SUPADRIV is a registered trademark of GNK and Fasteners Limited.

[2] Triplett is a trademark of the Triplett Corporation.

DIAGNOSTIC INFORMATION

START US MACHINES

Before you start the Start of Call procedure, you must determine which level machine you are working with. Level 2 machines can be identified with a serial number of 0500001 or higher. Level 3 machines can be identified with a serial number of 3000000 or higher. If the machine you are working with has a serial number above 0500000, go to Start of Call, Level 2, page 2-7.

If you are servicing a WW6 use the level 2 diagnostics. GO TO Start of Call, Level 2, page 2-7.

CAUTION
If you must disconnect the carrier cable from the printer board, be careful when you plug it back in. The lines of the cable must align correctly with the pins in the printer board connector and the cable must be fully seated. If the cable is installed incorrectly the printer board could be damaged when you turn the machine on.

START WT MACHINES

Before you start the Start of Call procedure, you must determine which level machine you are working with.

Model	Level	GO TO
6746	Level 1	page 2-2
6747	Level 1	page 2-2
6747-2 EMEA	Level 2	page 2-7
6747-2 AFE	Level 2	page 2-7
6746 EMEA above S/N 0500000	Level 2	page 2-7
6747 AFE above S/N 0085165	Level 2	page 2-7
6746 above S/N 3000000	Level 3	page 2-7

Note:
See Chart A on page 7-39 for a list of the AFE and EMEA countries.

START OF CALL, Level 1

Determine the machine level before you continue with this Start of Call procedure.

If you turn the machine off and back on again to verify a step in the Power on Reset (POR), you must turn the machine off, then wait 30 seconds before you turn it back on again.

If any LEDs are flashing, GO TO the Error Indications Diagnostic, page 2-23. If any LEDs start flashing while you are performing the Start of Call, or any diagnostic procedure, GO TO the Error Indications Diagnostic, page 2-23. If the LED pattern on your machine is not shown in the Error Indications Diagnostic, return to this page and go through the Start of Call procedure.

```
Turn the machine off.
Wait 30 seconds.
Turn the machine on.
Does the machine do something (LEDs light, motor movement,
solenoid operation, beep)?
|       |
Yes     No
|       |
|       Turn the machine off.
|       Disconnect J1P from the Printer board.
|       Turn the machine on.
|       Does the machine still fail?
|       |       |
|      Yes      No
|       |       |
|       |       GO TO the Options Inoperative Diagnostic, page 2-58.
|       |
|       GO TO the Dead Machine Diagnostic, Level 1, page 2-16.
|
Put a sheet of paper in the machine.
If SAPI does not work, pull the paper release lever forward and slide the paper in.
Press each character keybutton from A to Z.
Look for a change of LEDs, motor movement, solenoid operation, or beeps
as an indicator that the electronics senses the keybutton is being pressed.
Does the electronics sense any keybutton?
|       |
Yes     No
|       |
|       Continued at B on the next page.
|
Continued at A on the next page.
```

A B

Entry Point A

Turn the machine off.
Disconnect J1P from the Printer board.
Turn the machine on.
Does the machine still fail?

Yes No

GO TO the Options Inoperative Diagnostic, page 2-58.

Turn the machine off.
Check for loose or broken pins in J1P of the Printer Options Cable.
Check the options cable for continuity.
Is the options cable good?

Yes No

The OPTIONS ADAPTER BOARD/CABLE is failing.
Repair or install a new OPTIONS ADAPTER BOARD/CABLE.
Connect J1P to the printer board.
GO TO the Start of Call, Level 1, page 2-2.

Leave J1P disconnected.
GO TO the Incomplete POR Diagnostic, page 2-38.

Can you press all the keybuttons without locking the machine up?

Yes No

GO TO Entry Point A, above.

Turn the machine off.
Move the carrier to the right frame.
Turn the machine on.
Does the carrier move smoothly and quietly to the left side frame?

Yes No

GO TO the Transport Diagnostic, page 2-101.

Use semi-automatic paper insertion (SAPI) to load paper.
Does the paper load correctly without skewing, motor noise, and without marks?

Yes No

Continued at D on the next page.

Continued at C on the next page.

Start of Call, Level 1 (Contd)

```
C       D
|       |
|       Did the machine do something (LEDs light, motor movement,
|       solenoid operation, beep)?
|       |         |
|      Yes        No
|       |         |
|       |         Press each character keybutton from A to Z.
|       |         Look for a change of LEDs, motor movement, solenoid
|       |         operation, or beeps as an indicator that the electronics
|       |         senses the keybutton is being pressed.
|       |         Does the electronics sense any keybutton?
|       |         |        |
|       |        Yes       No
|       |         |        |
|       |         |        GO TO the Keyboard Diagnostic, page 2-47.
|       |         |
|       |         GO TO the SAPI Diagnostic, page 2-93.
|       |
|       GO TO the Paperfeed Diagnostic, page 2-59.
|
Press all the paper movement keybuttons (paper up/down, micro up/down).
Does the platen move up and down?
|       |
Yes     No
|       |
|       Press each keybutton.
|       Look for a change of LEDs, motor movement, solenoid operation,
|       or beeps as an indicator that the electronics senses the
|       keybutton is being pressed.
|       Is each keybutton sensed by the electronics?
|       |         |
|      Yes        No
|       |         |
|       |         GO TO the Keyboard Diagnostic, page 2-47.
|       |
|       GO TO the Paperfeed Diagnostic, page 2-59.
|
Press each keybutton.
Look for a change of LEDs, motor movement, solenoid operation, or beeps
as an indicator that the electronics senses the keybutton is being pressed.
Is each keybutton sensed by the electronics?
|       |
Yes     No
|       |
|       GO TO the Keyboard Diagnostic, page 2-47.
|
```

Continued at E on the next page

E

Do all the non-character keybuttons work correctly (tab set, margins, store)?

Yes No

Is the store LED flashing and the beeper beeping?

Yes No

GO TO the Keyboard Diagnostic, page 2-47.

Inform the operator that storage is full. GO TO
the IBM WHEELWRITER, 6746, 6747, 6747-2 Operating Instructions.

Perform each coded keybutton function.
Do the functions perform correctly?

Yes No

GO TO the Keyboard Diagnostic, page 2-47.

Turn all the indicator LEDs on, then off one at a time.
Do all the indicator LEDs turn on and off correctly?

Yes No

GO TO the Indicator Panel Diagnostic, page 2-42.

Type several characters.
Do characters print on the paper?

Yes No

GO TO the Ribbon and Correcting Tape Diagnostic, page 2-72.

Does the correct character print when a keybutton is pressed?

Yes No

GO TO the Selection Diagnostic, page 2-84.

Is the print quality good?

Yes No

GO TO the Print Quality Diagnostic, page 2-64.

Continued at F on the next page

Start of Call, Level 1 (Contd)

```
 F
 |
Is the correction quality good?
 |        |
Yes       No
 |        |
 |        GO TO the Print Quality Diagnostic, page 2-64.
 |
 |
Are any options Installed?
 |        |
Yes       No
 |        |
 |        No failure found.
 |        Try to duplicate the problem and go back through the Start of Call.
 |
GO TO the Options Inoperative Diagnostic, page 2-58.
```

START OF CALL, Level 2, Level 3

Ensure you have identified the machine level before you continue with this Start of Call procedure.

If you turn the machine off and back on again to verify a step in the Power on Reset (POR), you must turn the machine off, then wait 30 seconds before you turn it back on again.

If any LEDs are flashing, GO TO the Error Indications Diagnostic, page 2-23. If any LEDs start flashing while you are performing the Start of Call, or any diagnostic procedure, GO TO the Error Indications Diagnostic, page 2-23. If the LED pattern on your machine is not shown in the Error Indications Diagnostic, return to this page and go through the Start of Call procedure.

Turn the machine off.
Wait 30 seconds.
Turn the machine on.
Does the machine do one or more of the following:
-Does any indicator LED turn on?
-Does the machine beep?
-Does the printwheel move?
-Does the print hammer move?
-Does the carrier move?
-Does the ribbon move up and down?
-Does the platen move slightly down and up?

Yes No

Turn the machine off.
Is something plugged into J1P on the Printer board?

Yes No

GO TO the Dead Machine Diagnostic, Level 2, page 2-18

Disconnect J1P from the Printer board.
Turn the machine on.
Does the machine do any of the following:
- Does any motor turn?
- Does any indicator LED turn on?
- Does the print hammer move?
- Does the machine beep?

Yes No

Leave J1P disconnected.
GO TO the Dead Machine Diagnostic, Level 2, page 2-18

Go to the Options Inoperative Diagnostic, page 2-58.

Continued at A on the next page.

Start of Call, Level 2, Level 3 (Contd)

```
 A
 |
Turn the machine off.
Move the carrier to the center of the machine.
Wait 30 seconds.
Turn the machine on.
Does the machine perform all the following steps of the POR sequence:

 - All the indicator panel LEDs turn on?
 - The printwheel rotates?
 - The machine beeps one time?
 - The ribbon moves up and down?
 - The carrier moves to the left frame?
 - The carrier moves to the left margin?
 - The platen moves slightly down and up?
 - The print hammer moves (may be difficult to see)?
 - The printwheel homes (WW5, WW6, 6747, 6747-2 only)?
 - All indicator panel LEDs turn off except the linespace 1 LED?
 |       |
Yes      No
 |       |
 |       Is something plugged into J1P on the Printer board?
 |       |        |
 |      Yes       No
 |       |        |
 |       |        GO TO Entry Point A, on the next page.
 |       |
 |       |
 |       Turn the machine off.
 |       Disconnect J1P from the Printer board.
 |       Turn the machine on.
 |       Does the machine perform all the following steps of the POR sequence:
 |         - All the indicator panel LEDs turn on?
 |         - The printwheel rotates?
 |         - The machine beeps one time?
 |         - The ribbon moves up and down?
 |         - The carrier moves to the left frame?
 |         - The carrier moves to the left margin?
 |         - The platen moves slightly down and up?
 |         - The print hammer moves (may be difficult to see)?
 |         - The printwheel homes (WW5, WW6, 6747, 6747-2 only)?
 |         - All indicator panel LEDs turn off except the linespace 1 LED?
 |       |        |
 |      Yes       No
 |       |        |
 |       |        GO TO Entry Point A, on the next page.
 |       |
 |       Go to the Options Inoperative Diagnostic, page 2-58.
 |
Continued at B on the next page.
```

```
B       Entry Point A
|       |
|       Are any or all indicator panel LEDs flashing?
|       |      |
|      Yes     No
|       |      |
|       |      Do any indicator panel LEDs turn on?
|       |      |      |
|       |     Yes     No
|       |      |      |
|       |      |      Does the machine complete the POR sequence except
|       |      |      for the LEDs turning on?
|       |      |      |      |
|       |      |     Yes     No
|       |      |      |      |
|       |      |      |      GO TO the Machine Lockup Diagnostic, Level 2, page 2-51.
|       |      |      |
|       |      |      GO TO the Indicator Panel Diagnostic, page 2-42.
|       |      |
|       |      Do all indicator panel LEDs turn on and remain on?
|       |      |      |
|       |     Yes     No
|       |      |      |
|       |      |      Do all LEDs turn off and remain off?
|       |      |      |      |
|       |      |     Yes     No
|       |      |      |      |
|       |      |      |      Does any LED other than the linespace 1 remain on?
|       |      |      |      |     |
|       |      |      |     Yes    No
|       |      |      |      |     |
|       |      |      |      |     Does any LED stay off during POR?
|       |      |      |      |     |      |
|       |      |      |      |    Yes     No
|       |      |      |      |     |      |
|       |      |      |      |     |      Continued at I on the next page.
|       |      |      |      |     |
|       |      |      |      |     Continued at H on the next page.
|       |      |      |      |
|       |      |      |      Continued at G on the next page.
|       |      |      |
|       |      |      Continued at F on the next page.
|       |      |
|       |      Continued at E on the next page.
|       |
|       Continued at D on the next page.
|
Continued at C on the next page.
```

Start of Call, Level 2, Level 3 (Contd)

C D E F G H I

Do any LEDs turn on and off at random?

Yes
No

Go to the Incomplete
POR Diagnostic, page 2-38.

The FUNCTION BOARD is failing.
or
The PRINTER BOARD is failing.
or
The POWER SUPPLY BOARD is failing.

The symptom may change when it tries
to go through the POR sequence.
Try to get the symptom to change.
Turn the machine off, wait a few
seconds, then turn the machine on.
Do this several times.
Do you have the same symptom?

Yes
No

GO TO the Incomplete POR Diagnostic, page 2-38.

GO TO the Indicator Panel Diagnostic, page 2-42.

Does the machine complete the POR sequence
except for an LED other than the linespace
one LED remaining on?

Yes
No

GO TO the Machine Lockup Diagnostic, Level 2, page 2-51.

GO TO the Indicator Panel Diagnostic, page 2-42.

Continued at M on the next page.

Continued at L on the next page.

Continued at K on the next page.

Continued at J on the next page.

J K L M

Press the linespace keybutton 3 to 4 times.
Do any of the linespace LEDs turn on?

Yes: GO TO the Indicator Panel Diagnostic, page 2-42.

No: Press each character keybutton from A to Z. Look for a change of LEDs, motor movement, solenoid operation, or beeps as an indicator that the electronics senses the keybutton is being pressed.
Does the electronics sense any keybutton?

- Yes: GO TO the Indicator Panel Diagnostic, page 2-42.
- No: GO TO the Machine Lockup Diagnostic, level 2, page 2-51.

GO TO the Machine Lockup Diagnostic, Level 2, page 2-51.

GO TO the Error Indications Diagnostic, page 2-23.

Put a sheet of paper in the machine.
(If SAPI does not work, pull the paper release lever forward and slide the paper in.)
Press each character keybutton from A to Z.
Look for a change of LEDs, motor movement, solenoid operation, or beeps as an indicator that the electronics senses the keybutton is being pressed.
Does the electronics sense any keybutton?

No: GO TO the Keyboard Diagnostic, page 2-47.

Yes: Can you type 2 to 3 lines of characters without a machine lockup?

No: GO TO the Machine Lockup Diagnostic, Level 2, page 2-51.

Yes: Continued at N on the next page.

Start of Call, Level 2, Level 3 (Contd)

```
 N
 |
Turn the machine off.
Move the carrier to the right frame.
Turn the machine on.
Does the carrier move smoothly and quietly to the left side frame?
 |      |
Yes     No
 |      |
 |      GO TO the Transport Diagnostic, page 2-101.
 |
Use semi-automatic paper insertion (SAPI) to load paper.
Does the paper load correctly without skewing,
excessive motor noise, and without marks?
 |       |
Yes      No
 |       |
 |       Did the machine do something (LEDs light, motor movement,
 |       solenoid operation, beep)?
 |       |        |
 |      Yes       No
 |       |        |
 |       |        Press each character keybutton from A to Z.
 |       |        Look for a change of LEDs, motor  movement, solenoid operation,
 |       |        or beeps as an indicator that the electronics senses the
 |       |        keybutton is being pressed.
 |       |        Does the electronics sense any keybutton?
 |       |        |       |
 |       |       Yes      No
 |       |        |       |
 |       |        |       GO TO the Keyboard Diagnostic, page 2-47.
 |       |        |
 |       |        GO TO the SAPI Diagnostic, page 2-93.
 |       |
 |       GO TO the Paperfeed Diagnostic, page 2-59.
 |
Press all the paper movement keybuttons (paper up/down, micro up/down).
Does the platen move up and down?
 |      |
Yes     No
 |      |
 |      Press each character keybutton from A to Z.
 |      Look for a change of LEDs, motor movement, solenoid operation,
 |      or beeps as an indicator that the electronics senses the
 |      keybutton is being pressed.
 |      Does the electronics sense any keybutton?
 |      |       |
 |     Yes      No
 |      |       |
 |      |       GO TO the Keyboard Diagnostic, page 2-47.
 |      |
 |      GO TO the Paperfeed Diagnostic, page 2-59.
 |
```

Continued at O on the next page

O

Press each keybutton.
Look for a change of LEDs, motor movement, solenoid operation, or beeps as an indicator that the electronics senses the keybutton is being pressed.
Is each keybutton sensed by the electronics?

Yes No

GO TO the Keyboard Diagnostic, page 2-47.

Do all the non-character keybuttons work correctly (tab set, margins, store, shift, backspace, carrier return, spacebar, correction, code)?

Yes No

Is the store LED flashing and the beeper beeping?

Yes No

GO TO the Keyboard Diagnostic, page 2-47.

Inform the operator that storage is full. GO TO the IBM WHEELWRITER, 6746, 6747, 6747-2 Operating Instructions.

Perform each coded keybutton function.
Do the functions perform correctly?

Yes No

GO TO the Keyboard Diagnostic, page 2-47.

Turn all the indicator LEDs on, then off one at a time.
Do all the indicator LEDs turn on and off correctly?

Yes No

GO TO the Indicator Panel Diagnostic, page 2-42.

Type several characters.
Do characters print on the paper?

Yes No

GO TO the Ribbon and Correcting Tape Diagnostic, page 2-72.

Continued at P on the next page

Start of Call, Level 2, Level 3 (Contd)

```
 P
 |
Does the correct character print when a keybutton is pressed?
 |       |
Yes      No
 |       |
 |       GO TO the Selection Diagnostic, page 2-84.
 |
Is the print quality good?
 |       |
Yes      No
 |       |
 |       GO TO the Print Quality Diagnostic, page 2-64.
 |
 |
Is the correction quality good?
 |       |
Yes      No
 |       |
 |       GO TO the Print Quality Diagnostic, page 2-64.
 |
Are any options Installed?
 |       |
Yes      No
 |       |
 |       No failure found.
 |       Try to duplicate the problem and go back through the Start of Call.
 |       If you have an intermittent failure, GO TO the  Intermittent Failure
 |       Diagnostic, pg. 2-45.
 |
GO TO the Options Inoperative Diagnostic, page 2-58.
```

DIAGNOSTIC PROCEDURES

BATTERY BACKUP DIAGNOSTIC

CAUTION
If you disconnect J7F from the function board while the machine is turned off, memory will be lost. The following step must be done with the machine turned on.

```
Turn the machine on.
Disconnect J7F from the Function board.
Measure the voltage between J7F-1 (BAT) and J7F-3 (BAT+) on the plug.
Is it 4 to 5 VDC?
|        |
Yes      No
|        |
|        Remove the batteries from the battery pack.
|        Check the battery cable for continuity.
|        Check the battery pack for damage or corrosion.
|        Are the battery pack and cable good?
|        |         |
|       Yes        No
|        |         |
|        |         The BATTERY PACK is failing.
|        |
|        |
|        The BATTERIES are failing
|        or
|        The FUNCTION BOARD is failing.
|
Check all the lines in the system cable for continuity.
Is there continuity through all lines?
|        |
Yes      No
|        |
|        The SYSTEM CABLE is failing.
|
The FUNCTION BOARD is failing
 or
The PRINTER BOARD is failing
 or
The POWER SUPPLY (level 1), POWER SUPPLY BOARD (level 2, 3) is failing.
```

Note:
If you have repeated memory failures with level 2 machines, and you have replaced the Function board, replace the Power supply board.

DEAD MACHINE DIAGNOSTIC, Level 1

Is the machine completely dead (no LEDs on, no motor movement, no solenoid operation, no beep)?

Yes No

GO TO Start Of Call, Level 1, page 2-2.

Disconnect the line cord from the typewriter, but not from the AC outlet.
Check for AC line voltage at the typewriter end of the line cord.
Is the voltage correct?

Yes No

Unplug the line cord from the AC outlet.
Check the line cord for continuity.
Is there continuity?

Yes No

The LINE CORD is failing.
CAUTION: Use a cord with a 15-mm connector to maintain continued protection against fire.

Inform the customer there is a problem with the AC power from the outlet.

Turn the machine off.
Disconnect J6P from the Printer board.
Turn the machine on.
Connect the COM meter lead to the J6P-2 plug.
Measure the voltages at the J6P plug.
Remember to reset your meter to measure AC voltages at pins 3 and 4.
Are the voltages correct?

Yes No

J6P Plug	Signal Name	Voltage
Blank	-	-
1	DC COM	0 VDC
2	DC COM	COM meter lead
3	X1	9 to 18 VAC
4	X2	9 to 18 VAC
5	+12	6 to 18 VDC
6	-12	-6 to -18 VDC
7	+34	20 to 47 VDC
Blank	-	-

Continued at B on the next page.

Continued at A on the next page.

A

B

Turn the machine off

Check fuses F1 and F2 on the rectifier board.

Are both fuses good?

Yes

No

GO TO the Fuse Blown Diagnostic, Level 1, page 2-24.

Disconnect the Transformer Connector from the Transformer.

Turn the machine on.

Measure the AC line voltage at the transformer connector.

Is the AC line voltage correct?

Yes

No

Turn the machine off.

Remove the switch assembly from the machine.

Is the primary fuse good?

Yes

No

The PRIMARY FUSE is failing and
the POWER SUPPLY ASSEMBLY is failing.

If the switch assembly has a non-replaceable fuse,
you must replace the SWITCH ASSEMBLY.

CAUTION: The primary fuse prevents the power transformer from overheating. If you replace the fuse you must replace it with the same type fuse to maintain continued protection against fire.

The SWITCH ASSEMBLY is failing

The POWER SUPPLY ASSEMBLY is failing.

The PRINTER BOARD is failing.

DEAD MACHINE DIAGNOSTIC, Level 2, Level 3

Is the machine completely dead (no LEDs on, no motor movement, no solenoid operation, no beep)?

Yes No

GO TO Start Of Call, Level 2, 3 page 2-7.

Disconnect the line cord from the typewriter, but not from the AC outlet.
Check for AC line voltage at the typewriter end of the line cord.
Is the voltage correct?

Yes No

Unplug the line cord from the AC outlet.
Check the line cord for continuity.
Is there continuity?

Yes No

The LINE CORD is failing.
CAUTION: Use a cord with a 15-mm connector to maintain continued protection against fire.

Inform the customer there is a problem with the AC power from the outlet.

Connect the line cord to the typewriter.
Turn the machine on.
Measure the voltages on plug J6P.
Are the voltages correct?

Yes No

Plug J6P	Signal Name	Voltage
Blank	-	-
1	VRAM	4.6 to 5.6 VDC
2	DC COM	0 VDC
3	-5 VDC	-4.6 to -5.6 VDC
4	DC COM	0 VDC
5	+5 VDC	4.6 to 5.6 VDC
6	+15 VDC	13.2 to 15.6 VDC
7	DC COM	0 VDC
8	+34 VDC	27.2 to 46.9 VDC
Blank	-	-

Continued at B on the next page.

Continued at A on the next page.

Dead Machine Diagnostic, Level 2, Level 3 (Contd)

A

B

Turn the machine off.
Disconnect J6P from the Printer board.
Turn the machine on.
Measure the voltages at J6P on the plug.
Are the voltages correct?

Yes No

Plug J6P	Signal Name	Voltage
Blank	-	-
1	VRAM	4.6 to 5.6 VDC
2	DC COM	0 VDC
3	-5 VDC	-4.6 to -5.6 VDC
4	DC COM	0 VDC
5	+5 VDC	4.6 to 5.6 VDC
6	+15 VDC	13.2 to 15.6 VDC
7	DC COM	0 VDC
8	+34 VDC	27.2 to 46.9 VDC
Blank	-	-

Turn the machine off.
Unplug the line cord from the typewriter.
Turn the machine on.
Is there continuity between pins 1 and 2
on the AC input receptacle of the typewriter?

Yes No

Is the primary fuse good?

Yes No

GO TO Fuse Blown Diagnostic, Level 2, 3 p. 2-25.

Remove the ON/OFF Switch from the machine.
Is there continuity in the on/off switch?

Yes No

The ON/OFF SWITCH is failing.

The POWER SUPPLY ASSEMBLY is failing.

Continued at E on the next page.

Continued at D on the next page.

Continued at C on the next page.

Dead Machine Diagnostic, Level 2, Level 3 (Contd)

C D E

Turn the machine off.
Plug the line cord into the typewriter.
Disconnect J2 from the Power Supply Board.
Turn the machine on.
Set your meter to measure AC voltage.
Is the voltage 27 to 43 VAC between J2-1 and J2-2?

Yes No

No: The POWER SUPPLY ASSEMBLY is failing.

Yes: The POWER SUPPLY BOARD is failing.

Turn the machine off.
Connect J6P to the Printer board.
Disconnect J5P from the Printer board.
Turn the machine on.
Measure the voltages on the J6P plug (connected to the Printer board).
Are the voltages correct?

Yes No

No:
Turn the machine off.
Connect J5P to the Printer board.
Disconnect J4P from the Printer board.
Turn the machine on.
Measure the voltages on the J6P plug connected to the Printer board.
Are the voltages correct?

Yes No

Plug J6P	Signal Name	Voltage
Blank	-	-
1	VRAM	4.6 to 5.6 VDC
2	DC COM	0 VDC
3	-5 VDC	-4.6 to -5.6 VDC
4	DC COM	0 VDC
5	+5 VDC	4.6 to 5.6 VDC
6	+15 VDC	13.2 to 15.6 VDC
7	DC COM	0 VDC
8	+34 VDC	27.2 to 46.9 VDC
Blank	-	-

No: The PRINTER BOARD is failing.

Yes: GO TO the Homing Sensor diagnostic, page 2-26.

Yes: **Continued at G on the next page.**

Continued at F on the next page.

F G

Turn the machine off.
Connect J5P to the Printer board.
Disconnect J8F from the Function board.
Turn the machine on.
Measure the voltages on the J6P plug at the Printer board.
Are the voltages correct?

Yes No

J6P Plug	Signal Name	Voltage
Blank	-	-
1	VRAM	4.6 to 5.6 VDC
2	DC COM	0 VDC
3	-5 VDC	-4.6 to -5.6 VDC
4	DC COM	0 VDC
5	+5 VDC	4.6 to 5.6 VDC
6	+15 VDC	13.2 to 15.6 VDC
7	DC COM	0 VDC
8	+34 VDC	27.2 to 46.9 VDC
Blank	-	-

The SYSTEM CABLE is failing.

Turn the machine off.
Connect J8F to the Function board.
Disconnect J5F from the Function board.
Turn the machine on.
Measure the voltages on the J6P plug at the Printer board.
Are the voltages correct?

Yes No

The FUNCTION BOARD is failing.

The LED INDICATOR PANEL is failing.

The PRINTER BOARD is failing.

DISPLAY OPTION DIAGNOSTICS

```
Is the J3D plug correctly connected to J3D on the display board?
|     |
Yes   No
|     |
|     The DISPLAY is failing
|     or
|     The PRINTER/DISPLAY BOARD is failing.
|
Is the printer/display board installed correctly?
|     |
Yes   No
|     |
|     Install the printer/display board correctly.
|
Is the display blank, too dark, or too light?
|     |
Yes   No
|     |
|     Does the display have missing, partial, or extra characters?
|     |     |
|    Yes    No
|     |     |
|     |     Does the typewriter mode match the display mode switch position?
|     |     |     |
|     |    Yes    No
|     |     |     |
|     |     |     The DISPLAY is failing,
|     |     |     or
|     |     |     The PRINTER/DISPLAY BOARD is failing,
|     |     |     or
|     |     |     The OPTIONS ADAPTER BOARD/CABLE is failing.
|     |     |
|     |     |
|     |     No failure found.  If you suspect operator error, GO TO the What
|     |     Happened? section of the
|     |     WHEELWRITER, 6746, 6747, 6747-2 Operating Instructions.
|     |
|     The PRINTER/DISPLAY BOARD is failing
|     or
|     The DISPLAY is failing
|     or
|     The OPTIONS ADAPTER BOARD/CABLE is failing.
|
The PRINTER/DISPLAY BOARD is failing
or
The DISPLAY is failing
or
The OPTIONS ADAPTER BOARD/CABLE is failing.
```

ERROR INDICATIONS DIAGNOSTIC

LINE SPACING INDICATORS				ACTION
1	1.5	2	3	
☼	○	○	○	GO TO Selection Electrical Diagnostic, page 2-85.
○	☼	○	○	GO TO Paperfeed Electrical Diagnostic, page 2-60.
☼	☼	○	○	GO TO Incomplete POR Diagnostic, page 2-38.
○	○	☼	○	GO TO Transport Electrical Diagnostic, page 2-102.
☼	○	☼	○	GO TO Print Hammer Electrical Diagnostic page 2-66
○	☼	☼	○	GO TO Ribbon Electrical Diagnostic, page 2-74.
○	☼	○	☼	GO TO Ribbon Electrical Diagnostic, page 2-74.
☼	☼	○	☼	Turn the machine off. Wait 30 seconds, then turn the machine on. If you get the same error, ensure fuse F1 is good. Check the system cable for continuity. If it is good, the PRINTER BOARD is failing, or the POWER SUPPLY is failing.
○	☼	☼	☼	GO TO Homing Sensor Diagnostic, page 2-26.
☼	○	○	☼	Memory failure. The FUNCTION BOARD is failing.
☼	○	☼	☼	Turn the machine off. Wait 30 seconds, then turn the machine on. If you get the same error, check the system cable, for continuity. If it is good, the PRINTER BOARD is failing, or the POWER SUPPLY is failing.
☼	☼	☼	○	GO TO Keyboard Diagnostic, page 2-47.
☼	☼	☼	☼	Memory clear. GO TO Battery Backup Diagnostic, page 2-15.
○	○	○	○	GO TO Start Of Call, Level 1, page 2-2, or Start of Call, Level 2, 3 page 2-7.
●	●	●	●	GO TO Incomplete POR Diagnostic, page 2-38.

☼ = Flashing ○= Off ●= On

Note: If all LEDs on the indicator panel are on solid, (Level 2, 3 only) GO TO the Machine Lockup Diagnostic, Level 2, 3 page 2-51. If you have any other LED pattern GO TO Start of Call.

FUSE BLOWN DIAGNOSTIC, Level 1

Is the primary fuse in the ON/OFF Switch Assembly good?

Yes No

No:

The PRIMARY FUSE is failing and
the POWER SUPPLY ASSEMBLY is failing.
If the Switch Assembly has a non-replaceable fuse,
you must replace the SWITCH ASSEMBLY.

CAUTION: The primary fuse prevents the power transformer from overheating. If you replace the fuse you must replace it with the same type fuse to maintain continued protection against fire.

Yes:

Turn the machine off.
Disconnect J6P from the Printer board.
Replace fuses F1 and F2.
Does fuse F1 or fuse F2 blow when you turn the machine on?

Yes No

No:

Turn the machine off.
Wait 2 minutes for the capacitors to discharge.
Connect J6P to the Printer board.
Disconnect J8F from the Function board.
Does fuse F1 or fuse F2 blow when you turn the machine on?

Yes No

No:

Turn the machine off.
Connect J8F to the Function board.
Disconnect J5F from the Function board.
Does fuse F1 or fuse F2 blow when you turn the machine on?

Yes No

No:

Turn the machine off.
Connect J5F to the Function board.
Does F1 or F2 blow when you turn the machine on?

Yes No

No:

End the call.

Yes:

The INDICATOR PANEL and FUSE are failing.

Yes:

The FUNCTION BOARD and FUSE are failing.

Yes:

The PRINTER BOARD and FUSE are failing.

Yes:

The POWER SUPPLY ASSEMBLY is failing.

FUSE BLOWN DIAGNOSTIC, Level 2, Level 3

Turn the machine off.
Unplug the AC line cord from the typewriter.
Install a new primary fuse.
Plug the line cord into the typewriter.
Turn the machine on.
Does the primary fuse blow?

Yes No

GO TO Start of Call, Level 2, 3 page 2-7.

Turn the machine off.
Unplug the AC line cord from the typewriter.
Install a new primary fuse.
Disconnect J6P from the Printer board.
Turn the machine on.
Does the primary fuse blow?

Yes No

The PRINTER BOARD ASSEMBLY is failing.

The POWER SUPPLY ASSEMBLY is failing.

HOMING SENSOR DIAGNOSTIC, Level 1, Level 2

Note: If your machine is a Wheelwriter 3, Level 3, go to the Homing Sensor Diagnostic, Level 3, page 2-32.

Is the homing sensor flag (500-7) broken?

Yes No

Turn the machine off.
Push the carrier to the left sideframe.
Does the homing sensor flag contact the left sideframe?

Yes No

Install a homing sensor flag stop (520-14).

GO TO Entry Point A, below.

The HOMING SENSOR FLAG is failing.

Entry Point A
Turn the machine off.
Is a known good printwheel available?

Yes No

Check the printwheel.
Are the homing, pitch, and impression holes open, and is the printwheel free of binds? (To check for binds, push the printwheel toward the rear of the cartridge and rotate it.)
Is the printwheel good?

Yes No

The PRINTWHEEL is failing.

GO TO Entry Point B, on the next page.

Try a known good printwheel in the machine.
Does the machine operate correctly now?

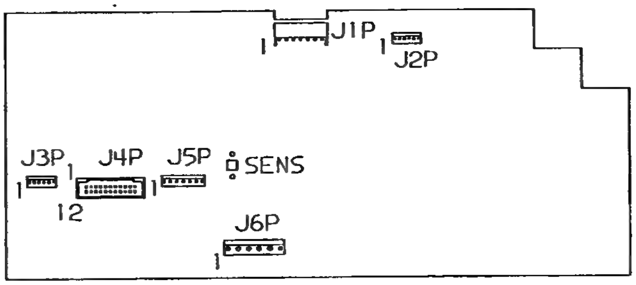
Yes No

GO TO Entry Point B, on the next page.

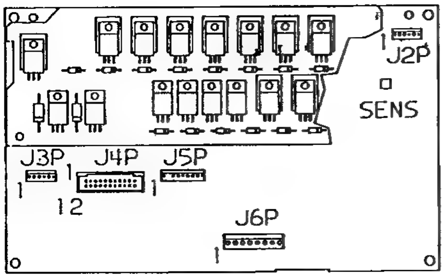
The original PRINTWHEEL is failing.

Entry Point B
Turn the machine off.
Remove the printwheel.
Remove the transport belt from the right pulley.
Turn the machine on.
Measure the voltage at the SENS pad on the Printer board as you slowly press in the homing sensor flag.
There should be 3 to 5 VDC when the flag is at rest.
There should be 0 to 1 VDC when the flag is operated.
Are the voltages correct?

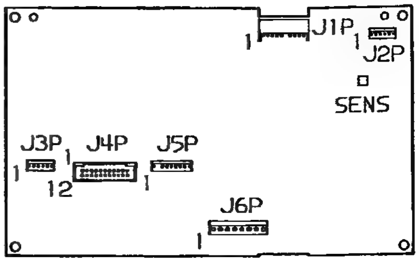
Yes No



Printer Board
Level 1



Printer Board
Level 2



Printer Board
Level 2

Note: The level 2 printer boards are compatible

Remove the carrier.
Check the homing sensor and LED for ribbon particles, obstructions and, paper dust.
Are the homing sensor and LED clean?

Yes No

Clean as necessary.
Install the carrier.
GO TO Start of Call.

Continued at B on the next page

Continued at A on the next page.

A B

Turn the machine off.

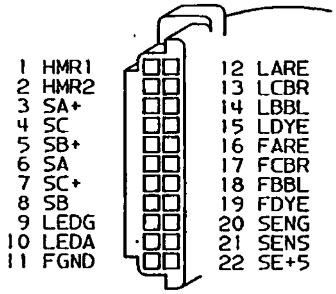
Set the meter on the 1K scale.

Set the polarity switch in the positive position.

Disconnect J4P from the Printer board.

Connect the meter to the connector as shown in the chart below.

Meter Lead	Connector J4P	Signal	Reading
COM VOM	Pin 9 Pin 10	LEDG LEDA	10K to 80K ohms
COM VOM	Pin 10 Pin 9	LEDA LEDG	500K ohms or more



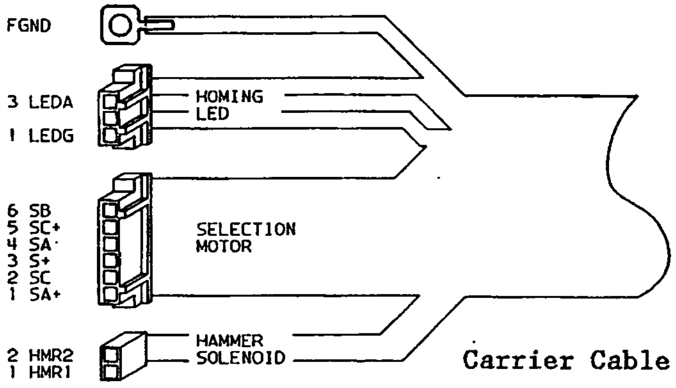
J4P

Are the measurements correct?

Yes No

Check the carrier cable for continuity between J4P-9 and pin 1 (LEDG) on the homing LED connector.

Check the carrier cable for continuity between J4P-10 and pin 3 (LEDA) on the homing LED connector.



Is there continuity in both lines?

Yes No

Continued at F on the next page.

Continued at E on the next page.

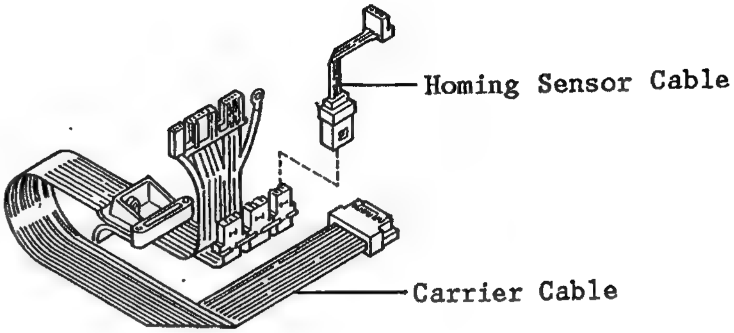
Continued at D on the next page.

Continued at C on the next page.

C D E F

Check the homing sensor cable (3 wires) for continuity.
Is there continuity?

Yes No



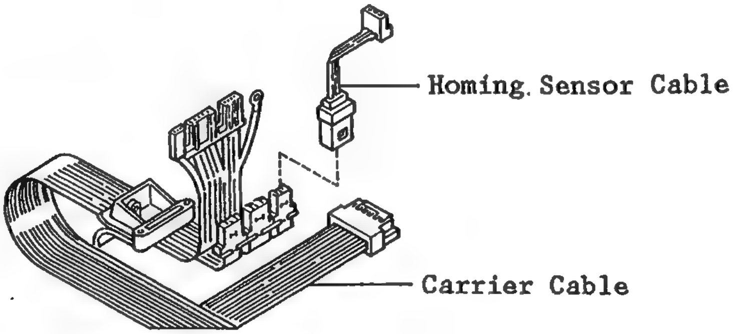
The HOMING SENSOR CABLE is failing.

The CARRIER CABLE is failing.

The HOMING LED is failing.

Check the homing sensor cable (3 wires) for continuity.
Is there continuity?

Yes No



The HOMING SENSOR CABLE is failing.

Continued at H on the next page.

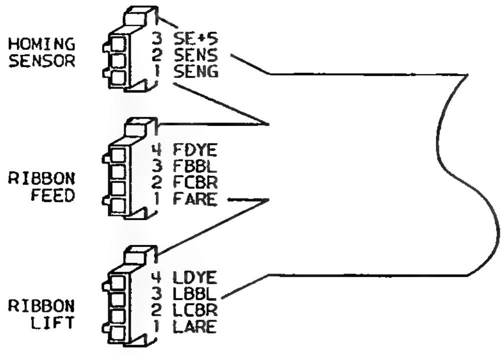
Continued at G on the next page.

G H

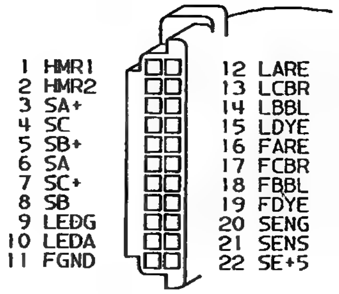
Check the carrier cable for continuity between the pins indicated in the chart below.

Meter Connections

J4P 9 to homing LED con. pin 1 (LEDG)
J4P 10 to homing LED con. pin 3 (LEDA)
J4P 20 to homing sensor con. pin 1 (SENG)
J4P 21 to homing sensor con. pin 2 (SENS)
J4P 22 to homing sensor con. pin 3 (SE+5)



Carrier Cable



J4P

Is there continuity?

Yes No

The CARRIER CABLE is failing.

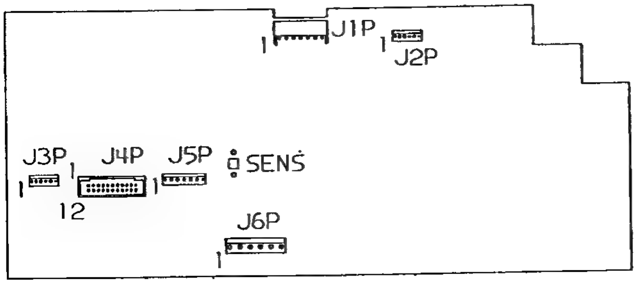
Continued at J on the next page.

Continued at I on the next page.

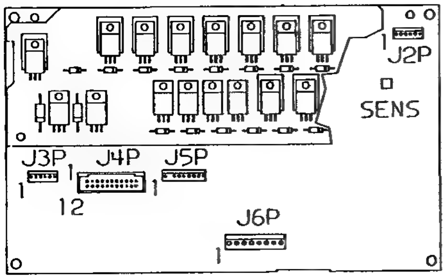
J

Connect all cables.
Install the carrier.
Turn the machine on.
Measure the voltage at the SENS pad on the Printer board as you slowly press in the homing sensor flag.

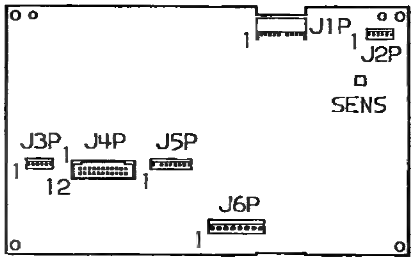
There should be 3 to 5 VDC when the flag is at rest.
There should be 0 to 1 VDC when the flag is pushed in.



Printer Board, Level 1



Printer Board, Level 2



Printer Board Level 2

Note: The level 2 printer boards are compatible

Are the voltages correct?

Yes — No

No: The PRINTER BOARD, HOMING SENSOR, or the SELECTION PLATE is failing.

Yes: Does the machine still have a failure?

Yes — No

No: End the call.

Yes: The HOMING LED, HOMING SENSOR, or the SELECTION PLATE ASSEMBLY is failing.

Turn the machine off.
Install the transport belt.
GO TO the Selection Diagnostic, page 2-84.

HOMING SENSOR DIAGNOSTIC, Level 3

```
Is the homing sensor flag (500-7) broken?
|        |
Yes      No
|        |
|        Turn the machine off.
|        Push the carrier to the left sideframe.
|        Does the homing sensor flag contact the left sideframe?
|        |       |
|       Yes      No
|        |       |
|        |       Install a homing sensor flag stop (520-14).
|        |
|        GO TO Entry Point A, below.
|
The HOMING SENSOR FLAG is failing.
```

Entry Point A

Turn the machine off.

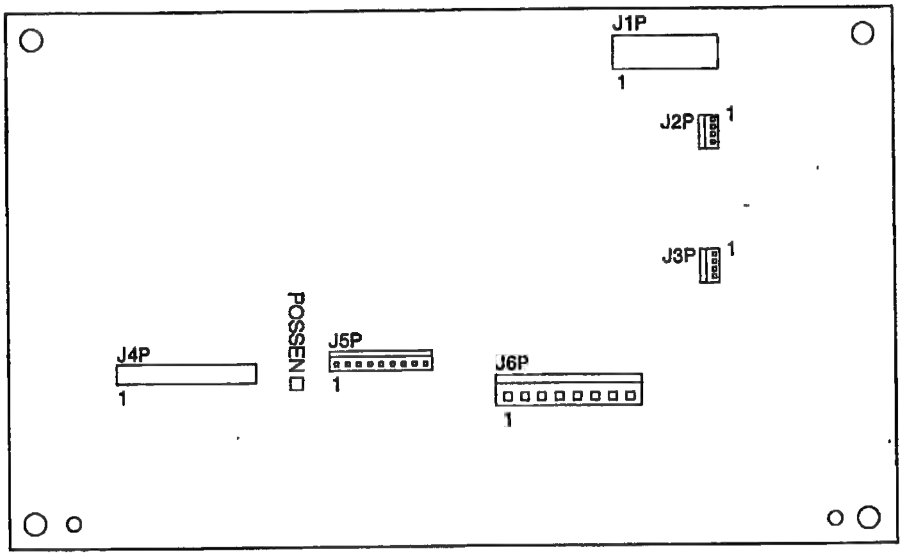
```
Observe the POR sequence as you turn the machine on.
Does the carrier move?
|        |
Yes      No
|        |
|        GO TO the Transport Diagnostic, page 2-101.
|
```

Turn the machine off.

```
Push the carrier to the center of the machine.
Turn the machine on.
Does the carrier move to the left side
frame and then to the home position?
|        |
Yes      No
|        |
|        Does the printwheel move?
|        |       |
|       Yes      No
|        |       |
|        |       GO TO the Selection Diagnostic, page 2-84.
|        |
|        Does the printwheel home?
|        |       |
|       Yes      No
|        |       |
|        |       GO TO Entry Point C in this diagnostic.
|        |
|        GO TO Entry Point B in this diagnostic.
|
GO TO the Transport Diagnostic, page 2-102.
```

Entry Point B
Turn the machine off.
Remove the printwheel.
Remove the transport belt from the right pulley.
Turn the machine on.
Measure the voltage at the POSSEN pad on the Printer board as you slowly press in the homing sensor flag.
There should be 3 to 5 VDC when the flag is at rest.
There should be 0 to 1 VDC when the flag is operated.
Are the voltages correct?

Yes | No



Printer Board
Level 3

No:
Remove the carrier.
Check the homing sensor and LED for ribbon particles, obstructions and, paper dust.
Are the homing sensor and LED clean?

Yes | No

No:
Clean as necessary.
Install the carrier.
GO TO Start of Call.

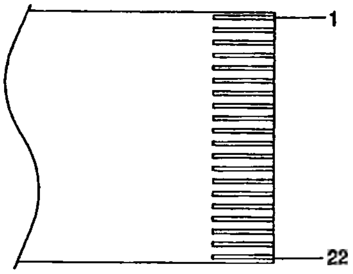
Continued at B on the next page

Continued at A on the next page.

A B

Turn the machine off.
Set the meter on the 1K scale.
Set the polarity switch in the positive position.
Disconnect the carrier cable from the Printer board.
Measure the resistance as indicated below.

Meter Lead	Carrier Cable	Reading
COM VOM	Pin 6 Pin 22	10K to 80K ohms
COM VOM	Pin 22 Pin 6	500K ohms or more



Carrier Cable

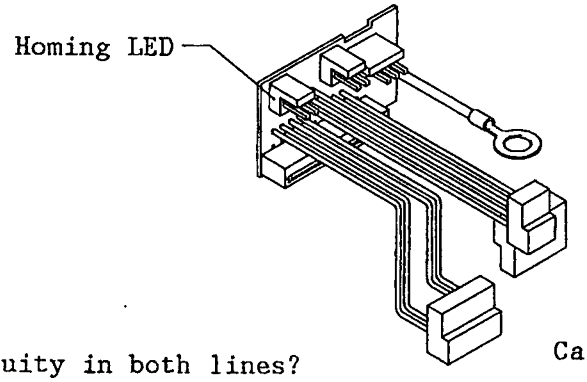
Are the measurements correct?

Yes

No

Check the carrier cable and carrier cable board for continuity between pin 22 on the carrier cable and pin 1 on the homing LED connector.

Check the carrier cable and carrier cable board for continuity between pin 6 on the carrier cable and pin 2 on the homing LED connector.



Carrier Cable Board

Is there continuity in both lines?

Yes

No

Continued at F on the next page.

Continued at E on the next page.

Continued at D on the next page.

Continued at C on the next page.

C D E F

Check the carrier cable for continuity.
Is there continuity?

Yes No

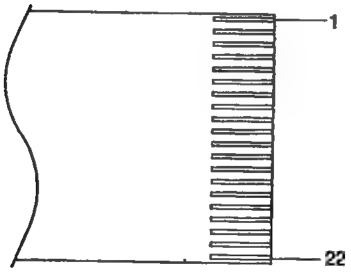
No: The CARRIER CABLE is failing.

Yes: The CARRIER CABLE BOARD is failing.

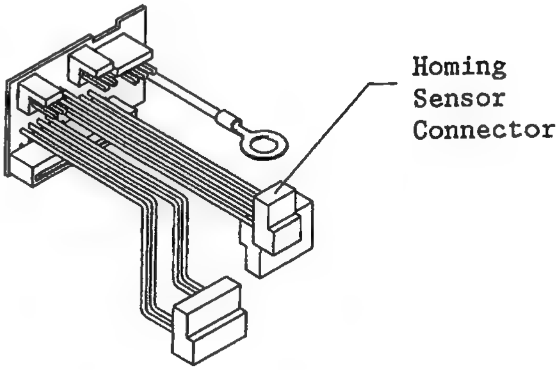
The HOMING LED is failing.

Check for continuity between the pins indicated in the chart below.

Meter Connections Carrier Cable
Pin 7 to homing sensor connector pin 1
Pin 20 to homing sensor connector pin 2
Pin 6 to homing sensor connector pin 3



Carrier Cable



Carrier Cable Board

Is there continuity?

Yes No

No: Check the carrier cable for continuity.
Is there continuity?

Yes No

No: The CARRIER CABLE is failing.

Yes: The CARRIER CABLE BOARD is failing.

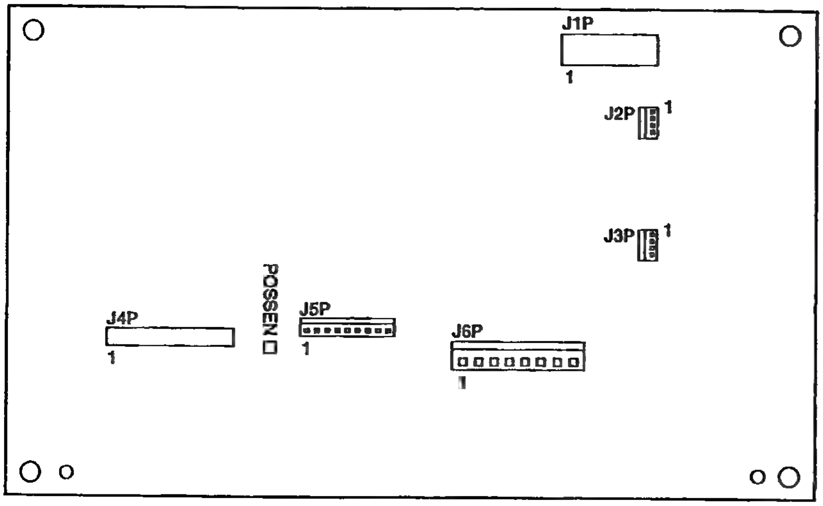
Continued at H on the next page.

Continued at G on the next page.

G H

Connect all cables.
Install the carrier.
Turn the machine on.
Again measure the voltage at the POSSEN pad on the Printer board as you slowly press in the homing sensor flag.

There should be 3 to 5 VDC when the flag is at rest.
There should be 0 to 1 VDC when the flag is pushed in.



Printer Board
Level 3

Are the voltages correct?

Yes | No

No: The PRINTER BOARD, HOMING SENSOR, or the SELECTION PLATE is failing.

Yes: Does the machine still have a failure?

Yes | No

No: GO TO Start of Call.

Yes: The HOMING LED, HOMING SENSOR, or the SELECTION PLATE ASSEMBLY is failing.

G: The PRINTER BOARD is failing.
or
The TRANSPORT MOTOR or TRANSPORT MOTOR CABLE is failing.

Entry Point C

Turn the machine off.

```
Is a known good printwheel available?
 |      |
Yes     No
 |      |
 |      Check the printwheel.
 |      Are the homing, pitch, and impression holes open, and is the
 |      printwheel free of binds? (To check for binds, push the
 |      printwheel toward the rear of the cartridge and rotate it.)
 |      Is the printwheel good?
 |      |       |
 |     Yes      No
 |      |       |
 |      |       The PRINTWHEEL is failing.
 |      |
 |      GO TO the Selection Diagnostic, page 2-84.
 |
Try a known good printwheel in the machine.
Does the machine operate correctly now?
 |      |
Yes     No
 |      |
 |      GO TO the Selection Diagnostic, page 2-84.
 |
The original PRINTWHEEL is failing.
```

INCOMPLETE POR DIAGNOSTIC

This diagnostic procedure checks each step of the POR sequence. You may need to turn the machine off and back on again to verify a specific step. Wait at least 30 seconds between each POR.

```
Turn the machine on.
Do all the LEDs turn on?
|        |
Yes      No
|        |
|        Check all the lines of the system cable for continuity.
|        Is there continuity?
|        |       |
|       Yes      No
|        |       |
|        |       The SYSTEM CABLE is failing.
|        |
|        The FUNCTION BOARD is failing
|        or
|        The PRINTER BOARD is failing.
|
|
Does the printwheel rotate slightly?
|        |
Yes      No
|        |
|        Check all the lines of the system cable for continuity.
|        Is there continuity?
|        |       |
|       Yes      No
|        |       |
|        |       The SYSTEM CABLE is failing.
|        |
|        The PRINTER BOARD is failing,
|        or
|        The POWER SUPPLY (level 1), POWER SUPPLY BOARD (level 2, 3) is failing
|        or
|        The FUNCTION BOARD is failing.
|
```

Continued at A on the next page

```
A
|
Does the machine beep?
|        |
Yes      No
|        |
|        Check all the lines of the system cable for continuity.
|        Is there continuity?
|        |       |
|       Yes      No
|        |       |
|        |       The SYSTEM CABLE is failing.
|        |
|        The FUNCTION BOARD is failing,
|        or
|        The PRINTER BOARD is failing.
|
Does the printwheel make approximately 3 revolutions?
|        |
Yes      No
|        |
|        Does the printwheel shake and not rotate?
|        |       |
|       Yes      No
|        |       |
|        |       Check all the lines of the system cable for continuity.
|        |       Is there continuity?
|        |       |       |
|        |      Yes      No
|        |       |       |
|        |       |       The SYSTEM CABLE is failing.
|        |       |
|        |       The FUNCTION BOARD is failing,
|        |       or
|        |       The PRINTER BOARD is failing.
|        |
|        GO TO the Selection Diagnostic, page 2-84.
|
Does the ribbon plate move up, then down?
|        |
Yes      No
|        |
|        GO TO the Ribbon and Correcting Tape Diagnostic, page 2-72.
|
Does the ribbon feed 1 time?
|        |
Yes      No
|        |
|        GO TO the Ribbon and Correcting Tape Diagnostic, page 2-72.
|
```

Continued at B on the next page

```
B
|
Set the left margin at zero.
Turn the machine off.
Move the carrier to the right frame.
Turn the machine on.
Does the carrier move to the left frame, then to the right?
If the machine is a WW5, WW6, 6747, or 6747-2 the carrier will move one space
to the right.
If the machine is a WW3 or 6746 the carrier will move one inch to the right.
|        |
Yes      No
|        |
|        Does the carrier continue to drive into the left frame?
|        |       |
|       Yes      No
|        |       |
|        |       Does the carrier continue to drive into the right frame?
|        |       |       |
|        |      Yes      No
|        |       |       |
|        |       |       The carrier may or may not move.
|        |       |       Is the transport motor noisy?
|        |       |       |       |
|        |       |      Yes      No
|        |       |       |       |
|        |       |       |       GO TO Entry Point A, below.
|        |       |       |
|        |       |       GO TO the Transport Diagnostic, page 2-101.
|        |       |
|        |       GO TO the Selection Diagnostic, page 2-84.
|        |
|        GO TO the Homing Sensor Diagnostic, page 2-26.
|
Entry Point A
|
Does the platen move slightly down, then up?
|        |
Yes      No
|        |
|        GO TO the Paperfeed Diagnostic, page 2-59.
|
```

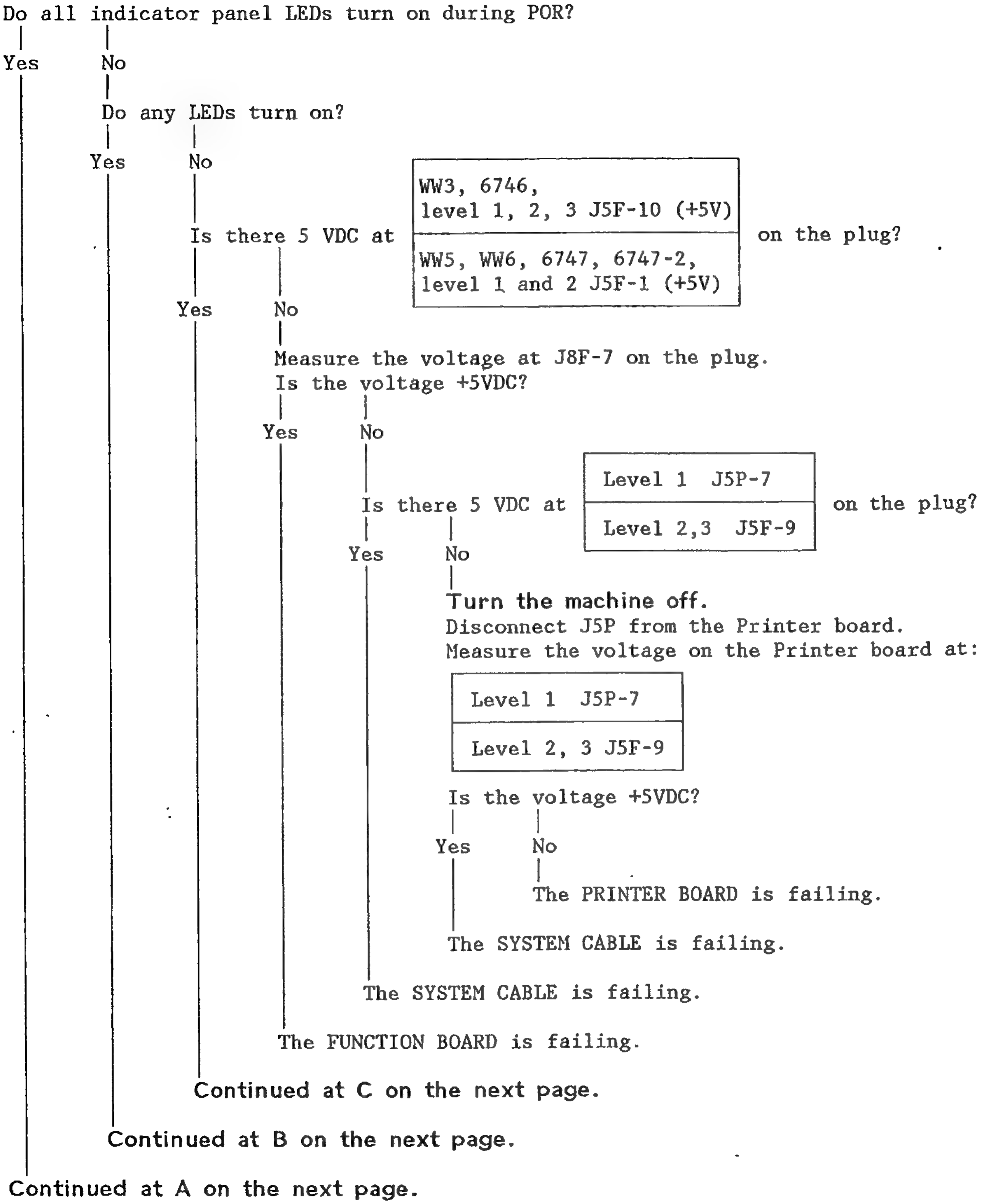
Continued at C on the next page

```
C
|
Does the print hammer operate one time?
(If you attach a small piece of paper to the hammer, you will see the movement.)
|         |
Yes       No
|         |
|         Does the print hammer energize?
|         |         |
|        Yes        No
|         |         |
|         |         GO TO the Print Quality Diagnostic, page 2-64.
|         |
|         GO TO Entry Point B below.
|
Does the print hammer hit too hard or remain activated?
|         |
Yes       No
|         |
|         GO TO Entry Point B below.
|
The PRINTER BOARD is failing.
```

Entry Point B

```
|
Are all the LEDs off except the linespace 1 LED?
|         |
Yes       No
|         |
|         GO TO the Battery Backup Diagnostic, page 2-15.
|
Put a sheet of paper in the machine.
If SAPI does not work, pull the paper release
lever forward and slide the paper in.
Press each character keybutton from A to Z.
Look for a change of LEDs, motor movement, solenoid operation, or beeps
as an indicator that the electronics senses the keybutton is being
pressed.
Does the electronics sense any keybutton?
|         |
Yes       No
|         |
|         GO TO the Keyboard Diagnostic, page 2-47.
|
GO TO Start Of Call, Level 1, page 2-2,
or
GO TO Start of Call, Level 2, page 2-7.
```

INDICATOR PANEL DIAGNOSTIC


Do all indicator panel LEDs turn on during POR?
Yes
No
Do any LEDs turn on?
Yes
No
Is there 5 VDC at
WW3, 6746, level 1, 2, 3 J5F-10 (+5V)
WW5, WW6, 6747, 6747-2, level 1 and 2 J5F-1 (+5V)
on the plug?
Yes
No
Measure the voltage at J8F-7 on the plug.
Is the voltage +5VDC?
Yes
No
Is there 5 VDC at
Level 1 J5P-7
Level 2,3 J5F-9
on the plug?
Yes
No
Turn the machine off.
Disconnect J5P from the Printer board.
Measure the voltage on the Printer board at:
Level 1 J5P-7
Level 2, 3 J5F-9
Is the voltage +5VDC?
Yes
No
The PRINTER BOARD is failing.
The SYSTEM CABLE is failing.
The SYSTEM CABLE is failing.
The FUNCTION BOARD is failing.
Continued at C on the next page.
Continued at B on the next page.
Continued at A on the next page.

A B C

CAUTION: Grounding the J5F +5V signal will blow fuse F2 in the power supply (Level 1). Do not ground J5F-10 in WW3 or 6746 (Level 1). Do not ground J5F-1 in WW5, 6747 (Level 1).

Ground J5F signals LTB, LTC, LTD, LTE, LTG, LTH, LTI, and LTJ in sequence.
Do the correct LEDs turn on?

Yes No

J5F Signal	WW5, WW6, 6747, 6747-2 LED Name	WW3 6746 LED Name
LTB	Shift Lock	Shift Lock
LTC	A Rtn	Not Used
LTD	Store	Not Used
LTE	Lang	Not Used
LTG	1	1
LTH	1.5	1.5
LTI	2	2
LTJ	3	3

No: The INDICATOR PANEL is failing.

Yes: The FUNCTION BOARD is failing.

CAUTION: Grounding the J5F +5V signal will blow fuse F2 in the power supply (Level 1). Do not ground J5F-10 in WW3 6746 (Level 1). Do not ground J5F-1 in WW5, 6747 (Level 1).

Ground the pin of the failing LED on J5F.
Does the LED turn on?

Yes No

J5F Signal	WW5, WW6, 6747, 6747-2 LED Name	WW3 6746 LED Name
LTB	Shift Lock	Shift Lock
LTC	A Rtn	Not Used
LTD	Store	Not Used
LTE	Lang	Not Used
LTG	1	1
LTH	1.5	1.5
LTI	2	2
LTJ	3	3

No: The INDICATOR PANEL is failing.

Yes: The FUNCTION BOARD is failing.

Continued at D on the next page.

D

Do the correct LEDs turn off when you change or turn off a function?

Yes

No

The FUNCTION BOARD is failing.
or
The INDICATOR PANEL is failing.

GO TO Start Of Call, Level 1, page 2-2,
or
GO TO Start of Call, Level 2, page 2-7.

INTERMITTENT FAILURE DIAGNOSTIC

Note: Play-in-loop may help you locate an intermittent failure.

Turn the machine off.
Check for loose, shorted or corroded pins, connectors, line cord, and cables before you replace any parts.

```
An intermittent failure could blow fuse F-3.
Check fuse F-3.
Turn the machine on.
Is this the first call for this symptom?
 |        |
Yes       No
 |        |
 |        Do the following:
 |        1. Locate the symptom on the next page.
 |        2. See the diagnostic listed.
 |        3. If you have already replace a FRU, replace the next
 |           most probable FRU until the machine is fixed.
 |
End the call.
```

SYMPTOM	MOST PROBABLE ORDER OF FRU FAILURE 1	2	3	4	SEE THESE DIAGNOSTICS
Dead Machine	C	M	E	D	Dead Machine Diagnostic Level 1, pg. 2-16 Level 2, 3 pg. 2-18
Fuses Blown	C	E	D	F	Fuse Blown Diagnostic Level 1, pg. 2-24 Level 2, 3 pg. 2-25
Homing Sensor Failure	H	C	A		Homing Sensor Diagnostic, pg. 2-26
Incomplete POR	H	C	E	D	Incomplete POR Diagnostic, pg, 2-38
Indicator Panel Failure	E	F			Indicator Panel Diagnostic, pg. 2-42
Keyboard Failure	B	E			Keyboard Diagnostic, pg. 2-47
Memory Failures	C	D	E		Battery Backup Diagnostic, pg. 2-15
Paperfeed Failure	C	G			Paperfeed Diagnostic, pg. 2-59
Print Hammer Failure	H	C			Print Hammer Electrical Diagnostic, pg. 2-66
Ribbon Failure	J	C			Ribbon and Correcting Tape Diagnostic, pg. 2-72
Selection Failure	H	K	C	I	Selection Diagnostic, pg. 2-84
Transport Failure	L	C			Transport Diagnostic, pg. 2-101

A Homing LED	E Function Board	I Carrier Cable	L Transport Asm
B Keyboard	F Indicator Panel	J Lift Motor/ Ribbon Plate	M Line Cord or On/Off Switch
C Printer Board	G Paperfeed Motor		
D Power Supply	H Selection Plate	K Printwheel	N Battery Case

KEYBOARD DIAGNOSTIC

Were you sent to this diagnostic from another diagnostic or from Start of Call?

Yes No

GO TO Start Of Call, Level 1, page 2-2,
or
GO TO Start of Call, Level 2, page 2-7.

Did the machine display an error indication (1, 1 1/2, 2 LED on)?

Yes No

GO TO Entry Point A, below.

Turn the machine off.
Disconnect J6F from the Function board.
Turn the machine on.
Does the machine still display an error indication (1, 1 1/2, 2 LED on)?

Yes No

GO TO the SAPI Diagnostic, page 2-93.

Entry Point A

Connect J6F.
Put a sheet of paper in the machine.
If SAPI does not work, pull the paper release lever forward and slide the paper in.
Press each character keybutton from A to Z.
Look for a change of LEDs, motor movement, solenoid operation, or beeps as an indicator that the electronics senses the keybutton is being pressed.
Does the electronics sense any keybutton?

Yes No

Disconnect J6F, (SAPI) from the Function board.
Does any keybutton work now?

Yes No

GO TO Entry point B on the next page.

GO TO the SAPI Diagnostic, page 2-93.

Is only one keybutton failing?

Yes No

GO TO Entry point B on the next page.

Continued at A on the next page

A

Does the code keybutton work correctly?

Yes No

GO TO Entry Point B, below.

Does the shift keybutton work correctly?

Yes No

Entry Point B

CAUTION: Test points for J2F are located on the function board at the rear of the connector. Early level machines do not have these test points. Be careful not to damage connector J2F if you must probe it.

Block the rear of the keyboard up about 25 mm (1 in).
Are there 4 to 6 VDC on all the sense lines (J2F-1 to J2F-8)?

Yes No

Leave the machine on.
Disconnect J2F from the Function board.
Are there 4 to 6 VDC at the J2F test point
for the failing sense line?

Yes No

The FUNCTION BOARD is failing.

The KEYBOARD is failing.

Continued at C on the next page

Continued at B on the next page

B C

CAUTION: Test points for J1F are located on the function board to the front of the connector. Early level machines do not have these test points. Be careful not to damage connector J1F if you must probe it.

Use the Drive Sense/Line chart, page 2-50, to determine the drive lines for the failing keybuttons.

Measure the voltage on each of the failing drive lines (J1F-1 to J1F-13).

There should be less than 1VDC with the keybutton at rest.
There should be more than 1VDC with the keybutton pressed.

Are the voltages correct?

Yes

No

The KEYBOARD is failing.
or
The FUNCTION BOARD is failing.

Turn the machine off.

Disconnect J2F from the Function board.
Check the continuity between line 9 and lines 10 through 15 on the J2F cable.
If there is a hole punched in the line, the meter should indicate infinity.
If there is no hole punched in the line, the meter should indicate 0 to 100 ohms.
Is the continuity correct?

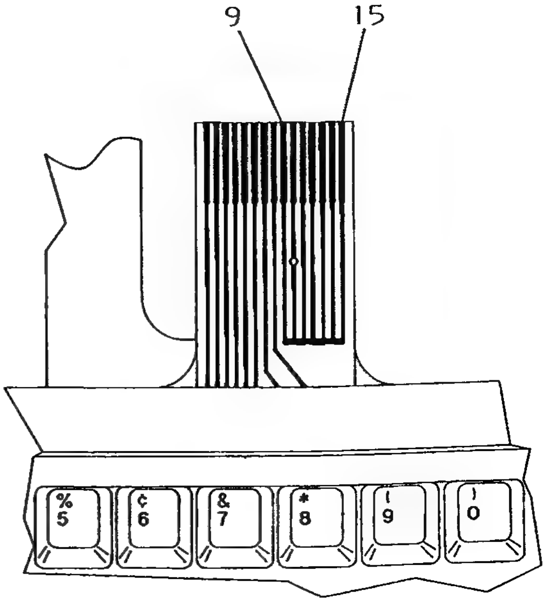
Yes

No

The KEYBOARD is failing.

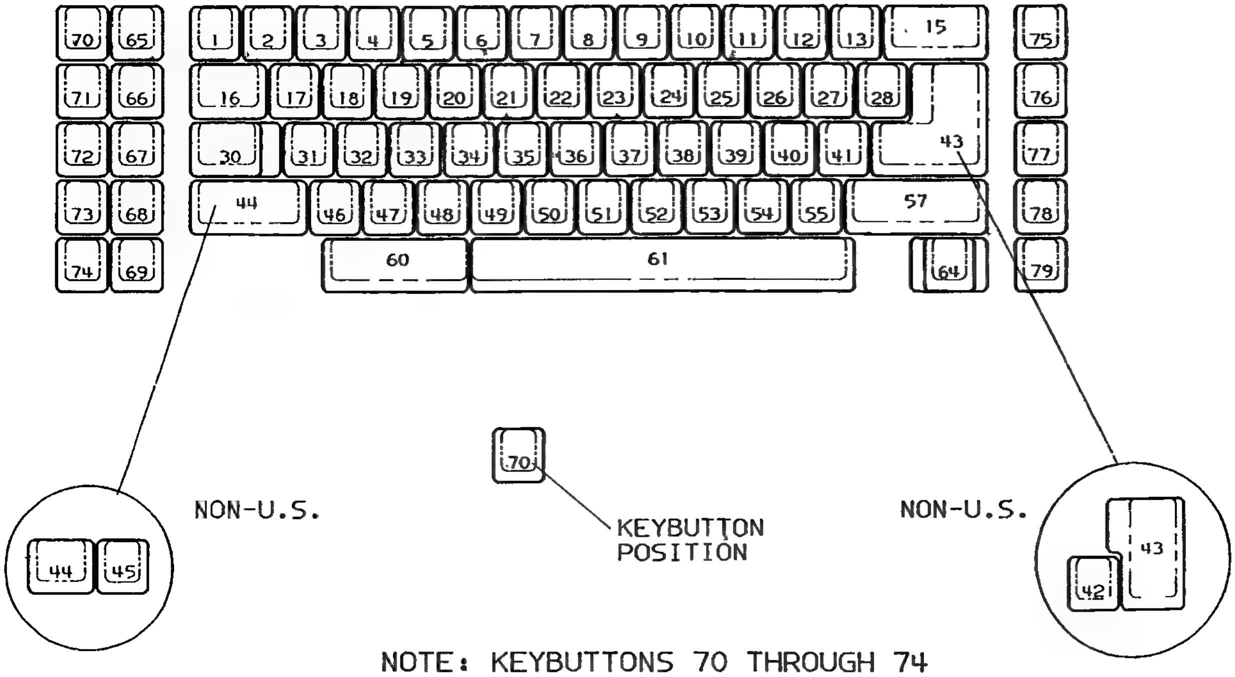
The FUNCTION BOARD is failing.

The KEYBOARD is failing.



Keyboard ID Lines

KEYBOARD DRIVE AND SENSE LINES



NOTE: KEYBUTTONS 70 THROUGH 74 ARE NOT USED ON WW3, 6746

KEYBUTTON POSITIONS TO DRIVE/SENSE LINES

SENSE LINES J2F

DRIVE LINES J1F	1	2	3	4	5	6	7	8
1								60
2	69	73	70	71	66	72	78	61
3	74	68	65		16	67	30	64
4								44 57
5		31	1	2	17		46	45
6		32		3	18		47	
7		33		4	19		48	
8	35	34	6	5	20	21	49	50
9	36	37	7	8	23	22	52	51
10		38	13	9	24	28	53	
11		39		10	25		54	
12	41	40	12	11	26	27	42	55
13		77	15	75	76		43	79

KEYBUTTON NUMBERS

MACHINE LOCKUP DIAGNOSTIC, Level 2

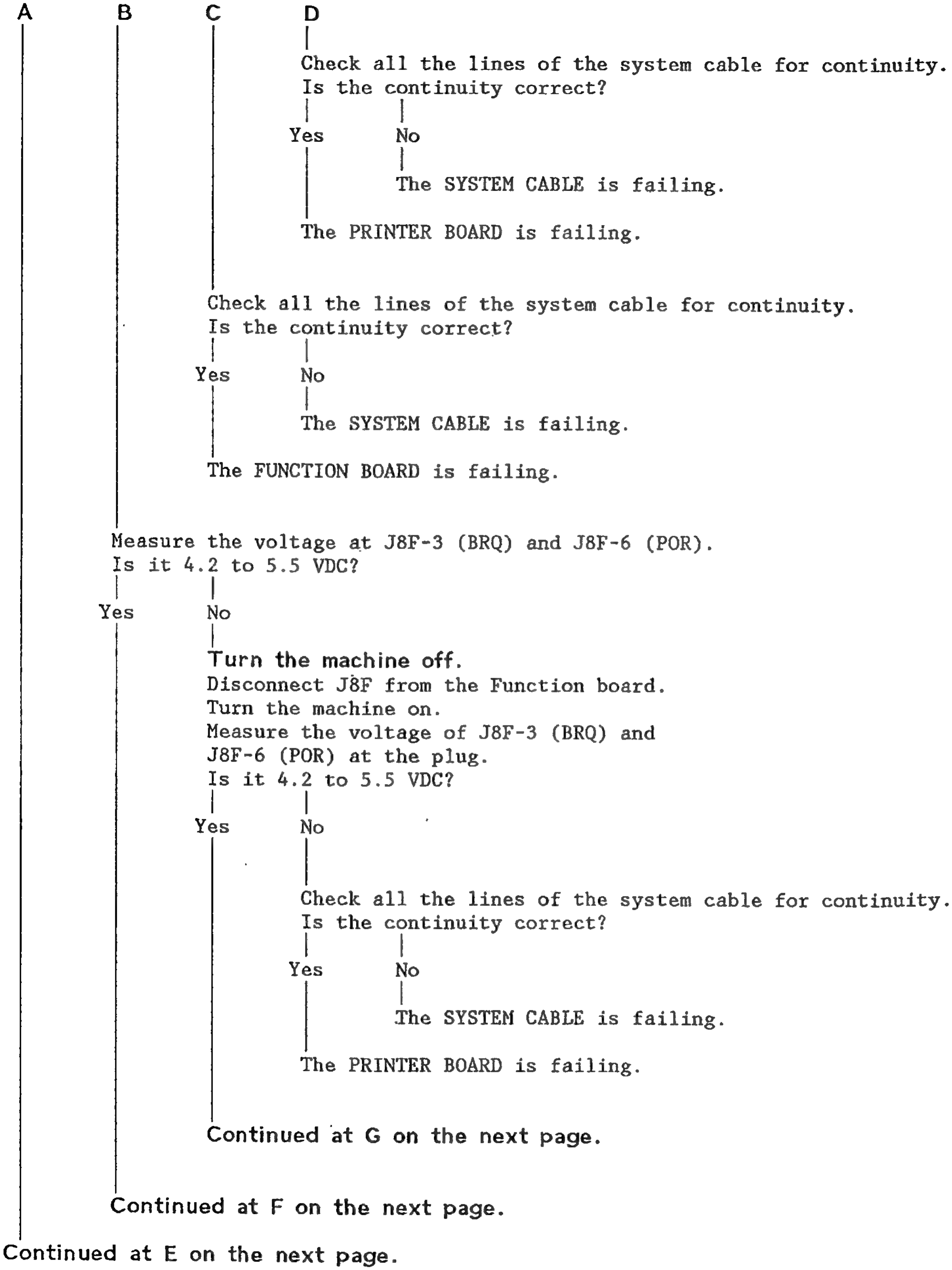
Note: If your machine is a Wheelwriter 3, Level 3, go to the Machine Lockup Diagnostic, Level 3, page 2-54.

Does the J4P plug have a good connection to the printer board?

- Yes
- No
  - Ensure it has a good connection.
  - GO TO Start of Call, Level 1, page 2-2.
  - or
  - GO TO Start of Call, Level 2, page 2-7.

Turn the machine off.
Wait 30 seconds.
Turn the machine on and wait 6 to 10 seconds.
Did the carrier move to the right, the machine beep 6 times, and the 1-1/2, 2, and 3 linespace LEDs start to flash?

- Yes
  - Continued at A on the next page.
- No
  - Measure the voltage on the plug at J6P-6.
    Is it 13.2 to 15.6 VDC?
    - Yes
      - Continued at B on the next page.
    - No
      - **Turn the machine off.**
        Disconnect J6P from the Printer board.
        Turn the machine on.
        Measure the voltage on the plug at J6P-6.
        Is it 13.2 to 15.6 VDC?
        - Yes
          - **Turn the machine off.**
            Connect J6P.
            Disconnect J8F from the Function board.
            Turn the machine on.
            Measure the voltage at J8F-3 (BRQ) and J8F-6 (POR).
            Is it 4.2 to 5.5 VDC?
            - Yes
              - Continued at C on the next page.
            - No
              - Continued at D on the next page.
        - No
          - The POWER SUPPLY BOARD is failing.



```
A      B      C       D
|      |      |       |
|      |      |       Check all the lines of the system cable for continuity.
|      |      |       Is the continuity correct?
|      |      |       |       |
|      |      |      Yes      No
|      |      |       |       |
|      |      |       |       The SYSTEM CABLE is failing.
|      |      |       |
|      |      |       The PRINTER BOARD is failing.
|      |      |
|      |      Check all the lines of the system cable for continuity.
|      |      Is the continuity correct?
|      |      |       |
|      |     Yes      No
|      |      |       |
|      |      |       The SYSTEM CABLE is failing.
|      |      |
|      |      The FUNCTION BOARD is failing.
|      |
|      Measure the voltage at J8F-3 (BRQ) and J8F-6 (POR).
|      Is it 4.2 to 5.5 VDC?
|      |      |
|     Yes     No
|      |      |
|      |      Turn the machine off.
|      |      Disconnect J8F from the Function board.
|      |      Turn the machine on.
|      |      Measure the voltage of J8F-3 (BRQ) and
|      |      J8F-6 (POR) at the plug.
|      |      Is it 4.2 to 5.5 VDC?
|      |      |       |
|      |     Yes      No
|      |      |       |
|      |      |       Check all the lines of the system cable for continuity.
|      |      |       Is the continuity correct?
|      |      |       |       |
|      |      |      Yes      No
|      |      |       |       |
|      |      |       |       The SYSTEM CABLE is failing.
|      |      |       |
|      |      |       The PRINTER BOARD is failing.
|      |      |
|      |      Continued at G on the next page.
|      |
|      Continued at F on the next page.
|
Continued at E on the next page.
```

```
E   F   G
|   |   |
|   |   Check all the lines of the system cable for continuity.
|   |   Is the continuity correct?
|   |   |   |
|   |  Yes  No
|   |   |   |
|   |   |   The SYSTEM CABLE is failing.
|   |   |
|   |   The FUNCTION BOARD is failing.
|   |
|   |
|   Turn the machine off.
|   Check all the lines of the system cable for continuity.
|   Is the continuity correct?
|   |   |
|  Yes  No
|   |   |
|   |   The SYSTEM CABLE is failing.
|   |
|   Move the carrier an inch from the right frame.
|   Turn the machine on.
|   Does the carrier move smoothly and quietly to the
|   left frame, then to the right?
|   |   |
|  Yes  No
|   |   |
|   |   Does the carrier continue to drive into the left frame?
|   |   |   |
|   |  Yes  No
|   |   |   |
|   |   |   Does the carrier move to the right?
|   |   |   |   |
|   |   |  Yes  No
|   |   |   |   |
|   |   |   |   GO TO the Transport Diagnostic, page 2-101
|   |   |   |
|   |   |   Does the carrier continue to drive into the right frame?
|   |   |   |   |
|   |   |  Yes  No
|   |   |   |   |
|   |   |   |   GO TO the Transport Diagnostic, page 2-101
|   |   |   |
|   |   |   GO TO the Selection Diagnostic, page 2-84
|   |   |
|   |   |
|   |   GO TO the Homing Sensor Diagnostic, page 2-26
|   |
|   The PRINTER BOARD is failing.
|   or
|   The FUNCTION BOARD is failing.
|
GO TO the Error Indications Diagnostic, page 2-23.
```

MACHINE LOCKUP DIAGNOSTIC, Level 3

```
Do the J4P and J5P plugs have good connections to the printer board?
 |        |
Yes       No
 |        |
 |        Ensure it has a good connection.
 |        GO TO Start of Call, Level 2, page 2-7.
 |
 |
Turn the machine off.
Wait 30 seconds.
Turn the machine on and wait 6 to 10 seconds.
Does the machine complete the POR sequence?
 |        |
Yes       No
 |        |
 |        Do all the LEDs remain on solid?
 |        |      |
 |       Yes     No
 |        |      |
 |        |      Do any LEDs come on during POR?
 |        |      |      |
 |        |     Yes     No
 |        |      |      |
 |        |      |      Check the system cable for continuity?
 |        |      |      Is the continuity correct?
 |        |      |      |      |
 |        |      |     Yes     No
 |        |      |      |      |
 |        |      |      |      The SYSTEM CABLE is failing.
 |        |      |      |
 |        |      |      The PRINTER BOARD is failing.
 |        |      |      or
 |        |      |      The FUNCTION BOARD is failing.
 |        |      |
 |        |      Did the machine beep 6 times and the 1 1/2, 2, and 3
 |        |      linespace LEDs start to flash?
 |        |      |      |
 |        |     Yes     No
 |        |      |      |
 |        |      |      GO TO Entry Point A in this diagnostic.
 |        |      |
 |        |      GO TO the Error Indications Diagnostic, page 2-23.
 |        |
 |        GO TO Entry Point A in this diagnostic.
 |
Continued at A on the next page.
```

```
 A
 |
Type 3 to 4 lines.
Does the machine lock up?
 |         |
Yes       No
 |         |
 |        GO TO Start of Call, Level 2, page 2-7.
 |
The FUNCTION BOARD is failing.
or
The PRINTER BOARD is failing.

Entry Point A
 |
Measure the voltage on the plug at J6P-6.
Is it 13.2 to 15.6 VDC?
 |         |
Yes       No
 |         |
 |        Turn the machine off.
 |        Disconnect J6P from the Printer board.
 |        Turn the machine on.
 |        Measure the voltage on the plug at J6P-6.
 |        Is it 13.2 to 15.6 VDC?
 |         |       |
 |        Yes     No
 |         |       |
 |         |      The POWER SUPPLY BOARD is failing.
 |         |
 |        Turn the machine off.
 |        Connect J6P.
 |        Disconnect J8F from the Function board.
 |        Turn the machine on.
 |        Measure the voltage at J8F-3 (BRQ) and J8F-6 (POR).
 |        Is it 4.2 to 5.5 VDC?
 |         |       |
 |        Yes     No
 |         |       |
 |         |      Check all the lines of the system cable for continuity.
 |         |      Is the continuity correct?
 |         |       |       |
 |         |      Yes     No
 |         |       |       |
 |         |       |      The SYSTEM CABLE is failing.
 |         |       |
 |         |      The PRINTER BOARD is failing.
 |         |
 |        Continued at C on the next page.
 |
Continued at B on the next page.
```

OPTIONS INOPERATIVE DIAGNOSTIC

Ensure all the option boards are installed correctly and the connections are good before you start this procedure.

Turn the machine off.

Ensure J1P is connected to the printer board.

Turn the machine on.

Is the options adapter board LED on?

Yes No

Install new option boards one at a time starting with the OPTIONS ADAPTER BOARD/CABLE until the machine is fixed or you have installed all the boards.

Did the options adapter board LED turn on?

Yes No

Turn the machine off.

Install new OPTIONS ADAPTER BOARD/CABLE and all the option boards at one time.

End the call.

Are there 3 option boards installed?

Yes No

GO TO the Two Option Boards Diagnostic, page 2-106.

GO TO the Three Option Boards Diagnostic, page 2-95.

```
D
|
Turn the machine off.
Check all the lines of the system cable for continuity.
Is the continuity correct?
|         |
Yes       No
|         |
|         The SYSTEM CABLE is failing.
|
Move the carrier an inch from the right frame.
Turn the machine on.
Does the carrier move smoothly and quietly to the
left frame, then one inch to the right?
|         |
Yes       No
|         |
|         Does the carrier continue to drive into the left frame?
|         |         |
|         Yes       No
|         |         |
|         |         Does the carrier move to the right?
|         |         |         |
|         |         Yes       No
|         |         |         |
|         |         |         GO TO the Transport Diagnostic, page 2-101
|         |         |
|         |         Does the carrier continue to drive into the right frame?
|         |         |         |
|         |         Yes       No
|         |         |         |
|         |         |         GO TO the Transport Diagnostic, page 2-102
|         |         |
|         |         GO TO the Selection Diagnostic, page 2-84
|         |
|         GO TO the Homing Sensor Diagnostic, page 2-26
|
The PRINTER BOARD is failing.
or
The FUNCTION BOARD is failing.
```

PAPERFEED ELECTRICAL DIAGNOSTIC, Level 3

Turn the machine on.
Set line space on 3.
Mark the platen.
Operate the carrier return 9 times.
Does the platen make a complete revolution without excessive noise?

- Yes
- No
  - Check for binds, loose, broken, or worn parts.
    Are the parts good?
    - Yes
      - GO TO Entry Point A, below.
    - No
      - Repair or replace parts as necessary.
        GO TO Start of Call.

Entry Point A
Turn the machine off.
Disconnect J2P from the Printer board.
Set the meter on X1.
Carefully zero the meter.
Measure the resistance of the paperfeed motor as indicated in the chart below.
To ensure accurate measurements, the motor should be at room temperature.
The resistance may be higher if the motor is hot.

Meter Connections	Reading
J2P-1 (IA+) to J2P-3 (IA)	6 to 8 ohms
J2P-4 (IB) to J2P-2 (IB)	6 to 8 ohms
J2P-2 (IB) to motor housing	Infinity
J2P-1 (IA+) to motor housing	Infinity
J2P-3 (IA) to motor housing	Infinity
J2P-4 (IB+) to motor housing	Infinity

Are the measurements correct?

- Yes
  - Continued at A on the next page.
- No
  - Continued at B on the next page.

PAPERFEED DIAGNOSTICS

SYMPTOM	SEQUENCE OF FRU CHECKS 1	2	3	4	5	6
Paperfeed and/or other keybuttons fail	G					
No paperfeed	F	E				
Too little paperfeed, skewing, bent, or wrinkled paper.	E	D	C	B	F	A
Noisy paperfeed	F	D				
Too much paperfeed	H					

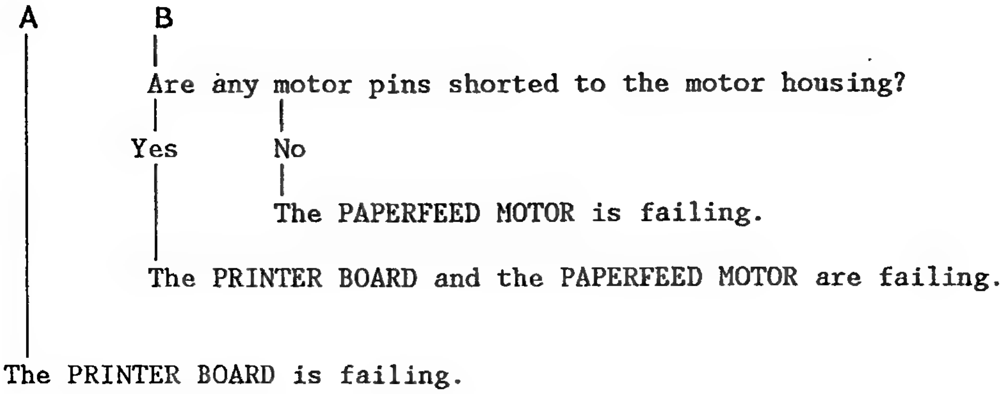
FRU CHECKS	CHECK FOR
A Cardholder	Cardholder Adjustment, page 3-1.
B Paper Release	Cams: Worn, cracked, broken, or loose on shaft
C Paper Bail	Rubber: Clean, worn or cracked Springs good Paper Bail arms worn
D Feed rollers and Deflector	Deflector adjustment, page 3-2 Rubber: Clean, worn or cracked
E Platen	Rubber: Clean, worn or cracked Latches good Gear worn
F Paperfeed Motor	If the motor is noisy or does not run, GO TO the Paperfeed Electrical Diagnostic, page 2-60. Gear: Loose, broken, or worn
G	GO TO the Keyboard Diagnostic, page 2-47.
H	The PRINTER BOARD is failing.

PRINT QUALITY DIAGNOSTICS

SYMPTOM	SEQUENCE OF FRU CHECKS 1	2	3	4	5	6	7	8
Malselection, divided characters, or hammer marks.	F	I	L					
Missing character. Character impression is on the paper.	H	E						
Missing character. No character impression on the paper.	F	G	J					
Impression is dark.	J	G	F					
Character alignment not correct	F	G	D	C	A			
Characters are light or have voids.	H	E	F	G	C	B	J	K
Erase not complete	H	E	F	G	D	C		

FRU CHECKS	CHECK FOR
A Bottom Cover	Bent or cracked Damaged, cracked, or hard frame latches (010-12)
B Cardholder	Cardholder Adjustment, page 3-1.
C Paperfeed Asm.	Worn or loose feed rollers Worn platen latches or platen
D Transport Asm.	Binds Worn carrier bearings, or lubrication Worn front carrier shoe Transport belt adjustment Loose or worn transport belt or belt mounting clamp Loose, worn or broken transport pulley Binding transport gear Loose transport pulley motor mounting screws Loose idler stud For electrical failures, GO TO the Transport Electrical Diagnostic, page 2-102.
E Ribbon/Tape	A known good ribbon or correcting tape.

Continued on the next page



Are any motor pins shorted to the motor housing?

No: The PAPERFEED MOTOR is failing.

Yes: The PRINTER BOARD and the PAPERFEED MOTOR are failing.

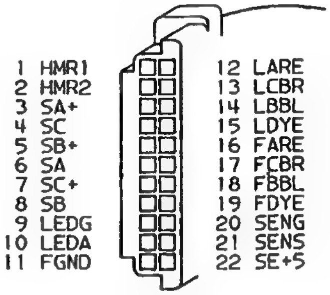
The PRINTER BOARD is failing.

PRINT HAMMER ELECTRICAL DIAGNOSTIC, Level 1, Level 2

Note: If your machine is a Wheelwriter 3, Level 3, go to the Print Hammer Electrical Diagnostic, Level 3, page 2-68.

Turn the machine off.
Disconnect J4P from the Printer board.
Set the meter on X1.
Carefully zero the meter.
Measure the resistance of the print hammer solenoid as indicated in the chart below.

Meter Connections	Reading
J4P-1 (HMR1) to J4P-2 (HMR2)	2 to 4 ohms
J4P-1 (HMR1) to solenoid housing	Infinity



J4P

Are the measurements correct?

Yes — Continued at A on the next page.

No

Are any solenoid pins shorted to the solenoid housing?

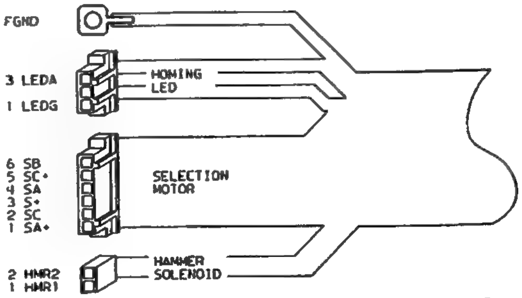
Yes — The PRINTER BOARD and the SELECTION PLATE ASSEMBLY are failing.

No

Disconnect the carrier cable from the print hammer solenoid.
Measure the continuity of lines J4P-1 (HMR1) and J4P-2 (HMR2) in the carrier cable.
Is there continuity?

Yes — The SELECTION PLATE ASSEMBLY is failing.

No — The CARRIER CABLE is failing.



Carrier Cable

Continued at A on the next page.

```
 A        B
 |        |
 |        Are any motor pins shorted to the motor housing?
 |        |       |
 |       Yes      No
 |        |       |
 |        |       Check the continuity of the paperfeed motor cable.
 |        |       Is there continuity?
 |        |       |      |
 |        |      Yes     No
 |        |       |      |
 |        |       |      The PAPERFEED MOTOR CABLE is failing.
 |        |       |
 |        |       The PAPERFEED MOTOR is failing.
 |        |
 |        |
 |        The PRINTER BOARD and the PAPERFEED MOTOR are failing.
 |
 |
The PRINTER BOARD is failing.
```

PRINT HAMMER ELECTRICAL DIAGNOSTIC, Level 3

Turn the machine off.
Disconnect J4P from the Printer board.
Disconnect the print hammer cable from the carrier cable board.
Set the meter on X1.
Carefully zero the meter.
Measure the resistance of the print hammer solenoid on the print hammer cable connector as indicated in the chart below.

Meter Connections	Reading
Pin-1 (HMR1) to Pin-2 (HMR2)	2 to 4 ohms
Pin-1 (HMR1) to solenoid housing	Infinity
Pin-2 (HMR2) to solenoid housing	Infinity

Are the measurements correct?

Yes

No

Are any solenoid pins shorted to the solenoid housing?

Yes

No

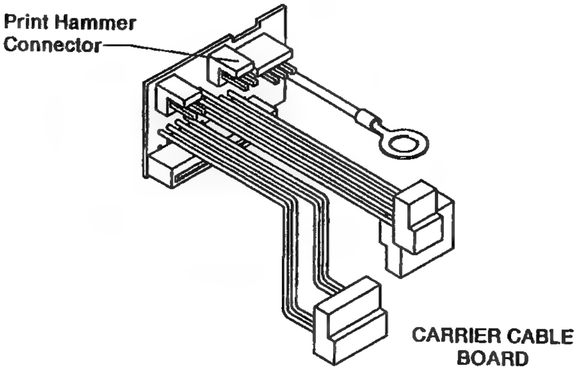
The SELECTION PLATE ASSEMBLY is failing.

The PRINTER BOARD and the SELECTION PLATE ASSEMBLY are failing.

Check the continuity of the print hammer lines in carrier cable board.
Is there continuity?

Yes

No



The CARRIER CABLE BOARD is failing.

Continued at A on the next page.

FRU CHECKS	CHECK FOR
F Printwheel	Binds in cartridge Defective or damaged petals Try a known good printwheel if one is available.
G Selection Plate Assembly	Even Top and Bottom Printing adjustment, page 3-2. Motor: Binds, loose mounting screws, loose connector Hub: Bent, broken, loose Hammer: Binds, loose head, worn stop, too much end play. For electrical failures, GO TO the Print Hammer Electrical Diagnostic, page 2-66. **Note**: The hammer solenoid does not energize when the printwheel is removed or when the machine is in the centering or decimal tab modes.
H Ribbon Plate or Lift Asm.	Gears: Binds, loose, or broken Motor: Binds, loose mounting screws, loose connector Worn tape feed clutch, pin, link or slot Worn lift cam or roller Loose lift stud Ribbon lift adjustment, page 3-4. For electrical failures, GO TO the Ribbon Electrical Diagnostic, page 2-74.
I	GO TO the Selection Diagnostic, page 2-84.
J	The PRINTER BOARD is failing.
K	The SELECTION PLATE ASSEMBLY is failing.
L Ribbon Lift Knock-Off Adj. (Level 3)	Ribbon Lift Knock-Off Adjustment, page 3-3.

PRINTER OPTION DIAGNOSTICS

```
Is there a computer connected to J1D?
|        |
Yes      No
|        |
|        GO TO Entry Point A, below.
|
|
Is the linespacing correct when you print information from the computer?
|        |
Yes      No
|        |
|        Does changing the line feed DIP switch fix the problem?
|        |         |
|       Yes        No
|        |         |
|        |         Move the line feed DIP switch to its original position.
|        |         GO TO Entry Point A, below.
|        |
|        End the call.
|
```

Entry Point A

```
|
Check connector J1D on the printer option board for broken parts and bent pins.
Check the printer option board common wire for damage.
Are both parts good?
|        |
Yes      No
|        |
|        The PRINTER/DISPLAY BOARD is failing.
|
|
Turn the machine off.
Note the position of the line feed DIP switch, then turn it off.
Install the wrap plug in connector J1D, and turn the machine on.
Does the printer/display board LED turn on and remain on?
|        |
Yes      No
|        |
|        GO TO Entry Point B on the next page.
|
Continued at A on the next page.
```

```
A
|
Were you sent to this diagnostic from the Error Indications Diagnostic?
|       |
Yes     No
|       |
|       GO TO the Print Quality Diagnostic, page 2-64.
|       or
|       The PRINTER BOARD is failing.
|
The PRINTER BOARD is failing.
```

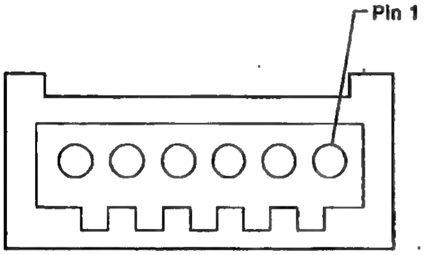
RIBBON ELECTRICAL DIAGNOSTIC, Level 1, Level 2

Note: If your machine is a Wheelwriter 3, Level 3, go to the Ribbon Electrical Diagnostic, Level 3, page 2-81.

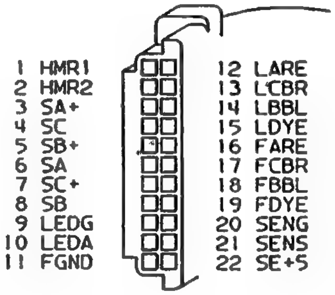
```
Type and correct a line of characters.
Is the ribbon mechanism working correctly?
|        |
Yes      No
|        |
|        Do you have any of the following symptoms:
|         - Linespace LEDs 1-1/2 and 3 flashing
|         - A problem with ribbon feed?
|        |        |
|       Yes       No
|        |        |
|        |        Do you have any of the following symptoms?
|        |         - Linespace LEDs 1-1/2 and 2 flashing
|        |         - A problem with ribbon lift
|        |         - A problem with correcting tape feed or lift?
|        |        |        |
|        |       Yes       No
|        |        |        |
|        |        |        GO TO the Ribbon and Correcting
|        |        |        Tape Diagnostic, page 2-72.
|        |        |
|        |        GO TO Entry Point B, page 2-78.
|        |
|        GO TO Entry Point A, page 2-75.
|
GO TO the Ribbon and Correcting Tape Diagnostic, page 2-72.
```

```
 A
 |
Check the continuity of the carrier cable.
Is there continuity?
 |       |
Yes      No
 |       |
 |       The CARRIER CABLE is failing.
 |
Were you sent to this diagnostic from the Error Indications Diagnostic?
 |       |
Yes      No
 |       |
 |       GO TO the Print Quality Diagnostic, page 2-64.
 |       or
 |       The PRINTER BOARD is failing.
 |
The PRINTER BOARD is failing.
```

Motor Without Test Connector	
Meter Connections	Reading
J4P-16 (FARE) to pin 3 or 4 of motor connector	10.5 to 13.5 ohms
J4P-17 (FCBR) to pin 3 or 4 of motor connector	10.5 to 13.5 ohms
J4P-18 (FBBL) to pin 3 or 4 of motor connector	10.5 to 13.5 ohms
J4P-19 (FDYE) to pin 3 or 4 of motor connector	10.5 to 13.5 ohms
J4P-16 (FARE) to motor housing	Infinity
J4P-17 (FCBR) to motor housing	Infinity
J4P-18 (FBBL) to motor housing	Infinity
J4P-19 (FDYE) to motor housing	Infinity



MOTOR CONNECTOR



J4P

Are the measurements correct?

Yes No

Are any motor pins shorted to the motor housing?

Yes No

Continued at C on the next page.

Continued at B on the next page.

Continued at A on the next page.

A

Turn the machine off.
Remove the wrap plug and turn the machine on.
Do all of the following occur when you press **Code + 5**:
Printwheel rotates?
Platen moves down and up?
Linespace 1-1/2, 2, and 3 LEDs turn on?

Yes

No

Entry Point B

The PRINTER/DISPLAY BOARD is failing.
or
The OPTIONS ADAPTER BOARD/CABLE is failing.
Move the line feed DIP switch, to its original position.
Install the printer cable in J1D.

Move the line feed DIP switch, to its original position.
Install the printer cable in J1D.
No failure found. If you suspect operator error, GO TO the What Happened? section of the IBM WHEELWRITER, 6746, 6747, 6747-2 Options Operating Instructions.

Entry Point B

Turn the machine off.

Disconnect J4P from the Printer board.

Set the meter on X1.

Carefully zero the meter.

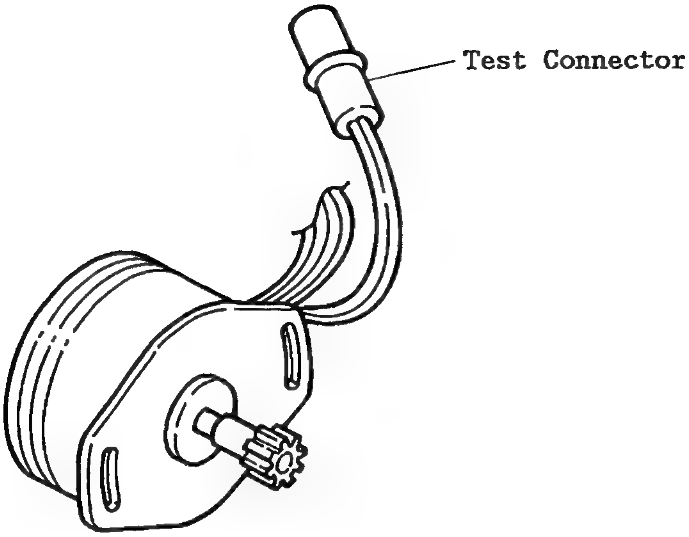
Measure the resistance of the ribbon lift motor between the points indicated in the chart below (these are critical measurements).

To ensure accurate measurements, the motor should be at room temperature.

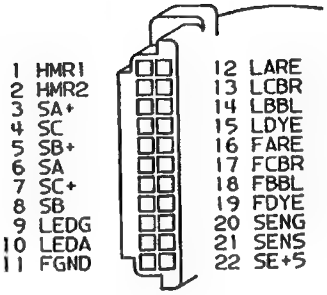
The resistance may be higher if the motor is hot.

If the motor you are measuring does not have a test connector, use the chart on the next page.

Meter Connections	Reading
J4P-12 (LARE) to test connector	16 to 18 ohms
J4P-13 (LCBR) to test connector	16 to 18 ohms
J4P-14 (LBBL) to test connector	16 to 18 ohms
J4P-15 (LDYE) to test connector	16 to 18 ohms
J4P-12 (LARE) to motor housing	Infinity
J4P-13 (LCBR) to motor housing	Infinity
J4P-14 (LBBL) to motor housing	Infinity
J4P-15 (LDYE) to motor housing	Infinity

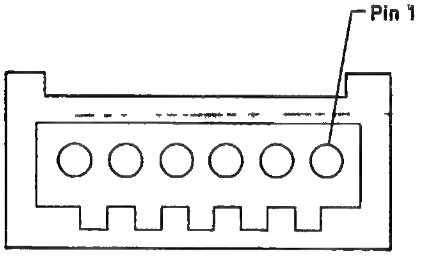


Ribbon Lift Motor

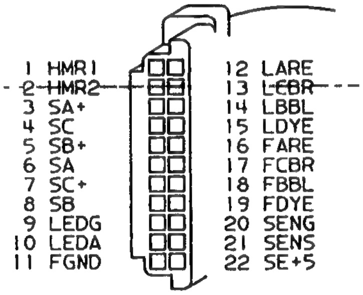


J4P

Motor Without Test Connector	
Meter Connections	Reading
J4P-12 (LARE) to pin 3 or 4 of motor connector	10.5 to 13.5 ohms
J4P-13 (LCBR) to pin 3 or 4 of motor connector	10.5 to 13.5 ohms
J4P-14 (LBBL) to pin 3 or 4 of motor connector	10.5 to 13.5 ohms
J4P-15 (LDYE) to pin 3 or 4 of motor connector	10.5 to 13.5 ohms
J4P-12 (LARE) to motor housing	Infinity
J4P-13 (LCBR) to motor housing	Infinity
J4P-14 (LBBL) to motor housing	Infinity
J4P-15 (LDYE) to motor housing	Infinity



MOTOR CONNECTOR



J4P

Are the measurements correct?

Yes

No

Continued at D on the next page.

Continued at C on the next page.

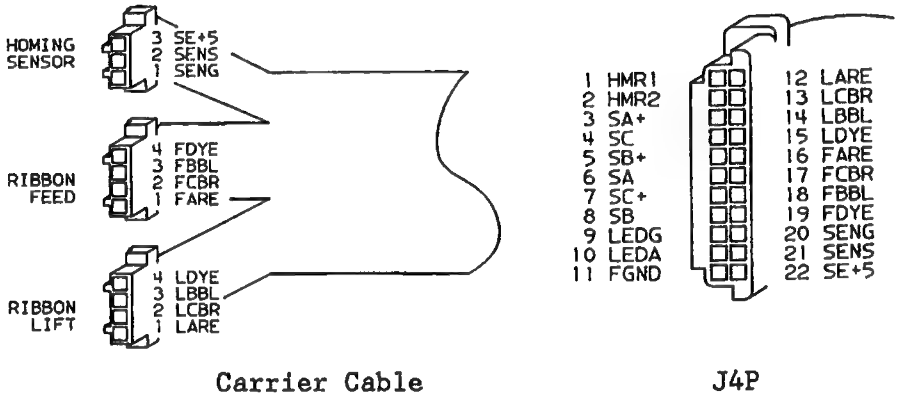
C D

Are any motor pins shorted to the motor housing?

Yes No

Check the continuity of the ribbon lift motor lines in the carrier cable. Is there continuity?

Yes No



The CARRIER CABLE is failing.

The RIBBON LIFT MOTOR is failing.

The PRINTER BOARD and the RIBBON LIFT MOTOR are failing.

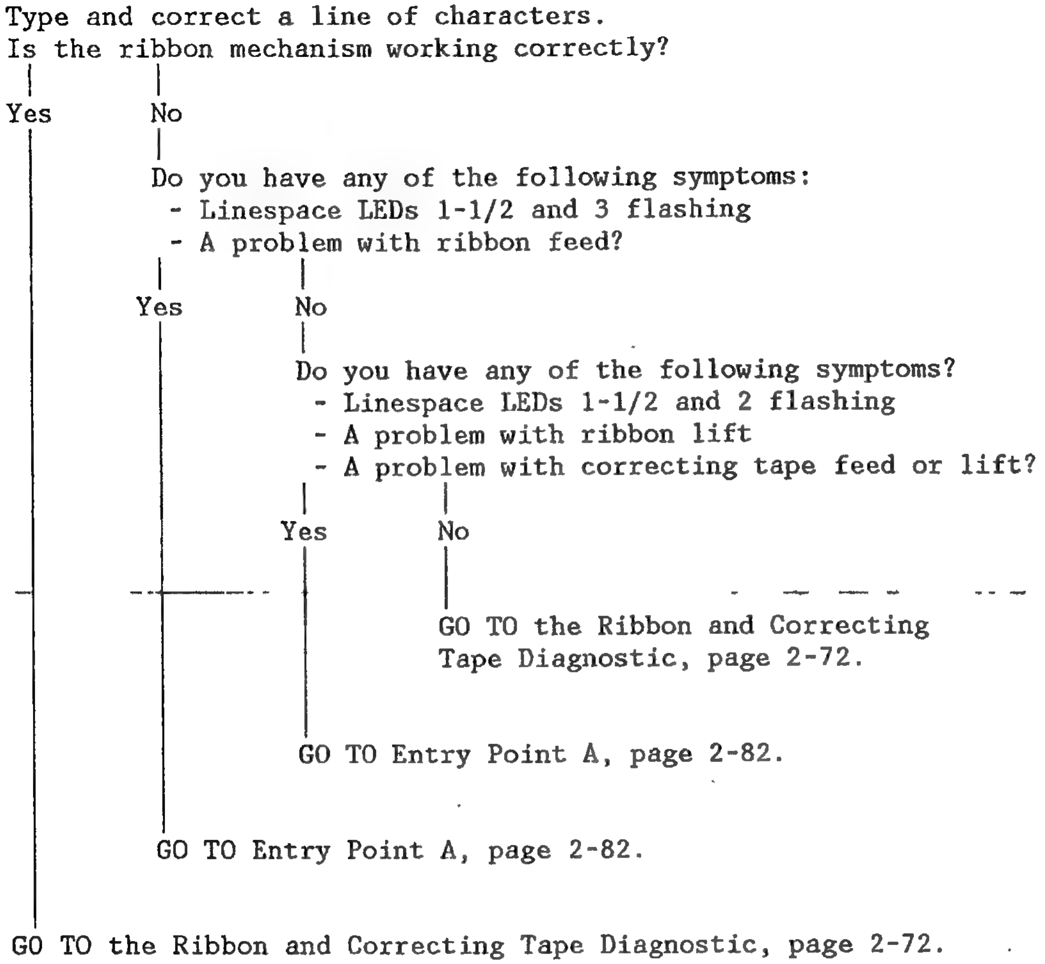
Were you sent to this diagnostic from the Error Indications diagnostic?

Yes No

GO TO the Ribbon and Correcting Tape Diagnostic, page 2-56,
or
The PRINTER BOARD is failing.

The PRINTER BOARD is failing.

RIBBON ELECTRICAL DIAGNOSTIC, Level 3



Type and correct a line of characters.
Is the ribbon mechanism working correctly?

Yes

No

Do you have any of the following symptoms:
- Linespace LEDs 1-1/2 and 3 flashing
- A problem with ribbon feed?

Yes

No

Do you have any of the following symptoms?
- Linespace LEDs 1-1/2 and 2 flashing
- A problem with ribbon lift
- A problem with correcting tape feed or lift?

Yes

No

GO TO the Ribbon and Correcting Tape Diagnostic, page 2-72.

GO TO Entry Point A, page 2-82.

GO TO Entry Point A, page 2-82.

GO TO the Ribbon and Correcting Tape Diagnostic, page 2-72.

Entry Point A

Turn the machine off.

Set the meter on X1.

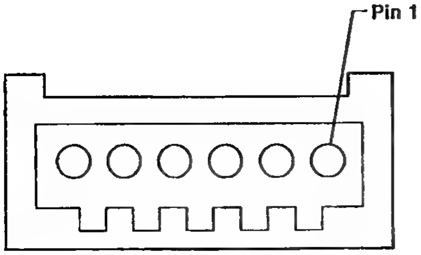
Carefully zero the meter.

Measure the resistance of the ribbon feed/lift motor between the points indicated in the chart below (these are critical measurements).

To ensure accurate measurements, the motor should be at room temperature.

The resistance may be higher if the motor is hot.

Meter Connections on the motor connector	Reading
Pin 1 to Pin 5	11 to 16 ohms
Pin 2 to Pin 6	11 to 16 ohms
Pin 1 to Pin 2 or 6	Infinity
Pin 2 to Pin 1 or 5	Infinity
Pin 1 to motor housing	Infinity
Pin 2 to motor housing	Infinity
Pin 3 to motor housing	Infinity
Pin 4 to motor housing	Infinity



MOTOR CONNECTOR

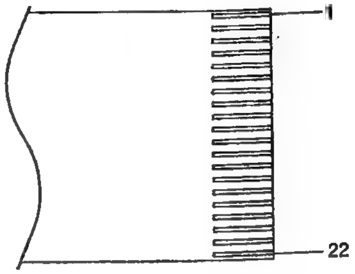
Are the measurements correct?

Yes No

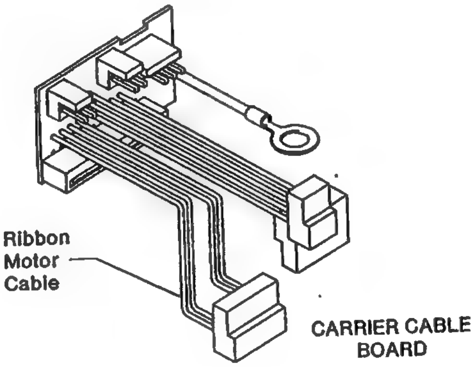
Continued at B on the next page.

Continued at A on the next page.

```
A       B
|       |
|       Are any motor pins shorted to the motor housing?
|       |       |
|      Yes      No
|       |       |
|       |       The RIBBON LIFT/FEED MOTOR is failing.
|       |
|       The PRINTER BOARD and the RIBBON LIFT/FEED MOTOR are failing.
|
Were you sent to this diagnostic from the error indications diagnostic?
|       |
Yes     No
|       |
|       Check the continuity of the ribbon
|       lift/feed motor lines in the carrier
|       cable.
|       The lines are: 5, 8, 9, 10, 11, 12, 17, 18.
|       Is the continuity correct?
|       |       |
|      Yes      No
|       |       |
|       |       The CARRIER CABLE is failing.
|       |
|       Check the carrier cable board and the ribbon lift/feed
|       motor cable for continuity.
|       Is there continuity?
|       |       |
|      Yes      No
|       |       |
|       |       The CARRIER CABLE BOARD is failing.
|       |
|       The PRINTER BOARD is failing.
|       or
|       GO TO the Ribbon and Correcting Tape Diagnostic, page 2-72.
|
The PRINTER BOARD is failing.
```



CARRIER CABLE



SELECTION DIAGNOSTICS

SYMPTOM	SEQUENCE OF FRU CHECKS 1	2	3
Printwheel does not rotate, is noisy, or its speed changes as it rotates	B	A	
Typewriter divides characters or makes print hammer marks.	B	A	
Carrier drives against right side frame.	A	B	
Print hammer does not energize.	A	B	
Character substitution	A	B	C

FRU CHECKS	CHECK FOR
A Selection Plate Assembly	Motor: Binds, loose screws, and loose connector Hub: Bent, broken, or loose Hammer: Binding or excessive end play Electrical failures, GO TO the Selection Electrical Diagnostic, page 2-85. If the hammer solenoid does not energize, GO TO the Print Hammer Electrical Diagnostic, page 2-66.
B Printwheel	Binds, broken or missing bias spring, broken cartridge, Bent printwheel petals, missing or large holes Try a known good printwheel if one is available. Electrical failures, GO TO the Selection Electrical Diagnostic, page 2-85.
C Function Board	Install a known good function board

SELECTION ELECTRICAL DIAGNOSTIC, Level 1, Level 2

Note: If your machine is a Wheelwriter 3, Level 3, go to the Selection Electrical Diagnostic, Level 3, page 2-89.

Does the machine complete a POR?

Yes No

Is a known good printwheel available?

Yes No

Check the printwheel.
Are the homing, pitch, and impression holes open, and is the printwheel free of binds? (To check for binds, push the printwheel toward the rear of the cartridge and rotate it.
Is the printwheel good?

Yes No

The PRINTWHEEL is failing.

Turn the machine off.
Check for binds in the selection motor.
Is the Selection motor good?

Yes No

The SELECTION PLATE ASSEMBLY is failing.

GO TO Entry Point A, page 2-87.

Try a known good printwheel in the machine.
Does the machine operate correctly now?

Yes No

Turn the machine off.
Check for binds in the selection motor.
Is the Selection motor good?

Yes No

The SELECTION PLATE ASSEMBLY is failing.

GO TO Entry Point A, page 2-87.

The original PRINTWHEEL is failing.

Continued at A on the next page.

A

Type several full lines of the lowercase characters "a n e" to test the motor coils.
Does this combination of characters print correctly?

Yes No

Is a known good printwheel available?

Yes No

Check the printwheel.
Are the homing, pitch, and impression holes open, and is the printwheel free of binds? (To check for binds, push the printwheel toward the rear of the cartridge and rotate it.
Is the printwheel good?

Yes No

The PRINTWHEEL is failing.

Turn the machine off.
Check for binds in the selection motor.
Is the Selection motor good?

Yes No

The SELECTION PLATE ASSEMBLY is failing.

GO TO Entry Point A, page 2-87.

Try a known good printwheel in the machine.
Does the machine operate correctly now?

Yes No

Turn the machine off.
Check for binds in the selection motor.
Is the Selection motor good?

Yes No

The SELECTION PLATE ASSEMBLY is failing.

GO TO Entry Point A, page 2-87.

The original PRINTWHEEL is failing.

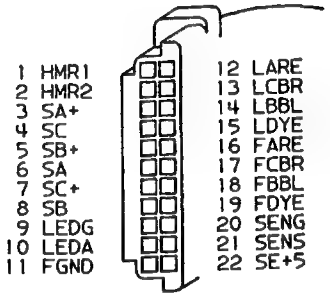
GO TO the Selection Diagnostic, page 2-84.

Entry Point A

Turn the machine off.

Disconnect J4P from the Printer board.
Set the meter on X1.
Carefully zero the meter.
Measure the resistance of the selection motor between the points indicated in the chart below (these are critical measurements).
To ensure accurate measurements, the motor should be at room temperature.
The resistance may be higher if the motor is hot.

Meter Connections	Reading
J4P-3 (SA+) to J4P-6 (SA)	4 to 6 ohms
J4P-4 (SC) to J4P-7 (SC+)	4 to 6 ohms
J4P-5 (SB+) to J4P-8 (SB)	4 to 6 ohms
J4P-4 (SC) to motor housing	Infinity
J4P-6 (SA) to motor housing	Infinity
J4P-8 (SB) to motor housing	Infinity



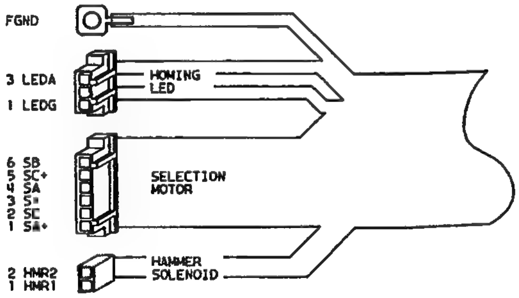
J4P

Are the measurements correct?

Yes — Continued at B on the next page.

No — Are any pins shorted to the motor housing?

- Yes — Continued at C on the next page.
- No — Check the continuity of all the selection motor lines in the carrier cable. Is there continuity?
  - Yes — The SELECTION PLATE ASSEMBLY is failing.
  - No — The CARRIER CABLE is failing.



Carrier Cable

B C

The PRINTER BOARD and SELECTION PLATE ASSEMBLY are failing.

Were you sent to this diagnostic from the error indications diagnostic?

Yes No

GO TO the Selection Diagnostic, page 2-84.
or
The PRINTER BOARD is failing.

The PRINTER BOARD is failing.

SELECTION ELECTRICAL DIAGNOSTIC, Level 3

```
Does the machine complete a POR?
 |       |
Yes      No
 |       |
 |       Is a known good printwheel available?
 |       |      |
 |      Yes     No
 |       |      |
 |       |      Check the printwheel.
 |       |      Are the homing, pitch, and impression holes open, and is
 |       |      the printwheel free of binds? (To check for binds, push
 |       |      the printwheel toward the rear of the cartridge and rotate it.
 |       |      Is the printwheel good?
 |       |      |       |
 |       |     Yes      No
 |       |      |       |
 |       |      |       The PRINTWHEEL is failing.
 |       |      |
 |       |      Turn the machine off.
 |       |      Check for binds in the selection motor.
 |       |      Is the Selection motor good?
 |       |      |        |
 |       |     Yes       No
 |       |      |        |
 |       |      |        The SELECTION PLATE ASSEMBLY is failing.
 |       |      |
 |       |      GO TO Entry Point A, page 2-91.
 |       |
 |       Try a known good printwheel in the machine.
 |       Does the machine operate correctly now?
 |       |      |
 |      Yes     No
 |       |      |
 |       |      Turn the machine off.
 |       |      Check for binds in the selection motor.
 |       |      Is the Selection motor good?
 |       |      |        |
 |       |     Yes       No
 |       |      |        |
 |       |      |        The SELECTION PLATE ASSEMBLY is failing.
 |       |      |
 |       |      GO TO Entry Point A, page 2-91.
 |       |
 |       The original PRINTWHEEL is failing.
 |
```

Continued at A on the next page.

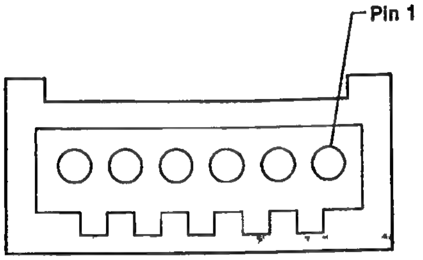
```
A
|
Type several full lines of the lowercase characters "a n e" to test the motor coils.
Does this combination of characters print correctly?
|      |
Yes    No
|      |
|      Is a known good printwheel available?
|      |     |
|     Yes    No
|      |     |
|      |     Check the printwheel.
|      |     Are the homing, pitch, and impression holes open, and is
|      |     the printwheel free of binds? (To check for binds, push
|      |     the printwheel toward the rear of the cartridge and rotate it.
|      |     Is the printwheel good?
|      |     |     |
|      |    Yes    No
|      |     |     |
|      |     |     The PRINTWHEEL is failing.
|      |     |
|      |     Turn the machine off.
|      |     Check for binds in the selection motor.
|      |     Is the Selection motor good?
|      |     |     |
|      |    Yes    No
|      |     |     |
|      |     |     The SELECTION PLATE ASSEMBLY is failing.
|      |     |
|      |     GO TO Entry Point A, page 2-91.
|      |
|      Try a known good printwheel in the machine.
|      Does the machine operate correctly now?
|      |     |
|     Yes    No
|      |     |
|      |     Turn the machine off.
|      |     Check for binds in the selection motor.
|      |     Is the Selection motor good?
|      |     |     |
|      |    Yes    No
|      |     |     |
|      |     |     The SELECTION PLATE ASSEMBLY is failing.
|      |     |
|      |     GO TO Entry Point A, page 2-91.
|      |
|      The original PRINTWHEEL is failing.
|
GO TO the Selection Diagnostic, page 2-84.
```

Entry Point A

Turn the machine off.

Disconnect the carrier cable from the Printer board.
Disconnect the Selection motor cable from the selection motor.
Set the meter on X1.
Carefully zero the meter.
Measure the resistance of the selection motor between the pins indicated (these are critical measurements).
To ensure accurate measurements, the motor should be at room temperature.
The resistance may be higher if the motor is hot.

Meter Connections Selection Motor Connector	Reading Reading
Pin 1 to Pin 5	11 to 15 ohms
Pin 2 to Pin 6	11 to 15 ohms
Pin 1 to Pin 2 or 6	Infinity
Pin 2 to Pin 1 or 5	Infinity
Pin 1 to motor housing	Infinity
Pin 2 to motor housing	Infinity
Pin 5 to motor housing	Infinity
Pin 6 to motor housing	Infinity



MOTOR CONNECTOR

Are the measurements correct?

Yes — No

No: Are any pins shorted to the motor housing?

Yes — No

No: The SELECTION PLATE ASSEMBLY is failing.

Yes: The PRINTER BOARD and SELECTION PLATE ASSEMBLY are failing.

Yes: Check the continuity between the carrier cable board and the selection motor cable.
Is there continuity?

Yes — No

No: The CARRIER CABLE BOARD is failing.

Yes:

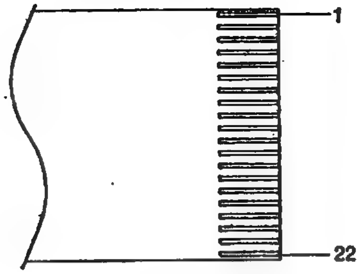
Continued at B on the next page.

B

Check the continuity of the selection lines in the carrier cable.
The lines are: 13, 14, 15, 16.
Is there continuity?

Yes — No

No:



CARRIER CABLE
(PRINTER BOARD END)

The CARRIER CABLE is failing.

Yes:

Were you sent to this diagnostic from the error indications diagnostic?

Yes — No

No:

GO TO the Selection Diagnostic, page 2-84.
or
The PRINTER BOARD is failing.

Yes:

The PRINTER BOARD is failing.

SEMI-AUTOMATIC PAPER INSERTION (SAPI) DIAGNOSTIC

Inspect the SAPI switch, springs, cable, and actuator.
Also check the paper deflector and feed rolls.
Is the mechanical operation of the switch and paperfeed good?

Yes

No

Repair as necessary.

Turn the machine off.
Disconnect J6F from the Function board.
Turn the machine on.
Carefully take the transport belt off its pulleys.
Short J6F-1 and J6F-2 together at the function board.
Does the platen rotate?

Yes

No

Turn the machine off.
Install the transport belt.
The FUNCTION BOARD is failing.

Leave the machine on.
Connect J6F to the function board.
Disconnect the SAPI cable from the SAPI switch.
Short the wires of the SAPI cable together.
Does the platen rotate?

Yes

No

Turn the machine off.
Install the transport belt.
The SAPI CABLE is failing.

Turn the machine off.
Install the transport belt.
The SAPI SWITCH is failing.

SPELL CHECK OPTION DIAGNOSTICS

```
Does the operator indicate the supplemental dictionary is losing words?
  |       |
Yes      No
  |       |
  |       Is the spell check board installed correctly?
  |       |        |
  |      Yes      No
  |       |        |
  |       |        Install the spell check board correctly.
  |       |
  |       The SPELL CHECK BOARD is failing.
  |       or
  |       The OPTIONS ADAPTER BOARD/CABLE is failing.
  |
Do the spell check batteries measure 3-5 VDC?
  |       |
Yes      No
  |       |
  |       Check the continuity of the battery holder.
  |       Is the continuity correct?
  |       |       |
  |      Yes     No
  |       |       |
  |       |       The BATTERY HOLDER is failing.
  |       |
  |       The BATTERIES are failing.
  |
The SPELL CHECK BOARD is failing.
or
The OPTIONS ADAPTER BOARD/CABLE is failing.
```

THREE OPTION BOARDS DIAGNOSTIC

```
Turn the machine on.
Press Code + 1.
Does the spell check beeper beep?
|       |
Yes     No
|       |
|       Press Code + 1 again.
|       Does the spell check beeper beep?
|       |       |
|      Yes      No
|       |       |
|       |       GO TO Entry Point D, page 2-98.
|       |
|       GO TO Entry Point A below.
|
```

Entry Point A

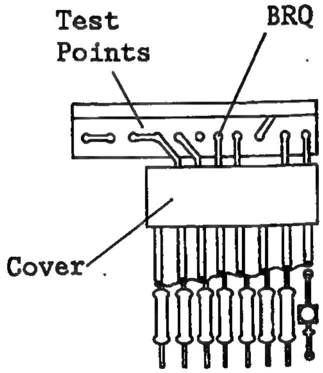
```
|
Type zzz followed by a space.
Repeat at least 8 times.
Does the spell check beeper beep when you type zzz followed by a space?
|       |
Yes     No
|       |
|       GO TO Entry Point D, page 2-98.
|
Does the spell check beeper beep when you type the word a followed by a space?
|       |
Yes     No
|       |
|       Does the operator indicate the supplemental dictionary is losing words?
|       |       |
|      Yes      No
|       |       |
|       |       GO TO Entry Point B on the next page.
|       |
|       GO TO the Spell Check Option Diagnostic, page 2-94.
|
GO TO Entry Point D, page 2-98.
```

Entry Point B

Is the printer/display board LED off?

Yes No

Remove the cover from J2 on the Options Adapter board.
Do not disconnect J2.
Take this measurement on the top of J2.
If the cover is not removable, use the test points above the connector to make the following voltage check.



J2

Is there 3 to 5 VDC at

Level 1	J2-4 (BRQ)
Level 2,3	J2-7 (BRQ)

on the top of J2?

Yes No

Turn the machine off.
Disconnect J1P from the Printer board.
Turn the machine on.
Is there 3 to 5 VDC at J8F-3 (BRQ) on the Function board?

Yes No

The FUNCTION BOARD is failing.

Is there 3 to 5 VDC at

Level 1	J5P-3 (BRQ)
Level 2,3	J5P-5 (BRQ)

on the printer board?

Yes No

The SYSTEM CABLE is failing.

The OPTIONS ADAPTER BOARD/CABLE is failing.
or
The PRINTER BOARD is failing.

The PRINTER/DISPLAY BOARD is failing.
or
The OPTIONS ADAPTER BOARD/CABLE is failing.

Continued at A on the next page

A

Is a Display installed?

Yes   No

GO TO Entry Point C, page 2-97.

Turn the machine off.
Wait 30 seconds.
Turn the machine on.
Adjust the display contrast control from minimum to maximum.
Does the Display change from blank to dark lines?

Yes   No

GO TO the Display Option Diagnostics, page 2-22.

Move the display mode switch to all positions.

-P (Print mode) = characters on Display only.
+P (Typewriter mode) = print as typed.
<┘P (Delayed print mode) = print when you end the line.

Do all the modes work?

Yes   No

GO TO the Display Option Diagnostics, page 2-22.

Do the characters appear on the display correctly?

Yes   No

GO TO the Display Option Diagnostics, page 2-22.

Entry Point C

Does the printer/display board have connector J1D?

Yes   No

No failure found. If you suspect operator error, GO TO the What Happened? section of the IBM WHEELWRITER, 6746, 6747, 6747-2 Options Operating Instructions.

Continued at B on the next page

B

Turn the machine on.
Do all of the following happen when you press **Code + 5**:
Printwheel rotates?
Platen moves down and up?
Line space 1-1/2, 2, and 3 LEDs turn on?

Yes No

GO TO the Printer Option Diagnostics, page 2-70.

Turn the machine off.
Note the position of the line feed DIP switch, then turn it off.
Install the wrap plug.
Turn the machine on.
Does the printer/display board LED, turn on and remain on?

Yes No

GO TO the Printer Option Diagnostics, page 2-70.

Move the line feed DIP switch, to its original position.
Remove the wrap plug.
Is the operator available to run a printout from the computer?

Yes No

End the call. There may still be a Printer Option problem which will need an operator's help to diagnose.

Can you identify a symptom with the operator's help?

Yes No

No failure found. If you suspect operator error, GO TO the What Happened? section of the IBM WHEELWRITER, 6746, 6747, 6747-2 Options Operating Instructions.

GO TO the Printer Option Diagnostics, page 2-70.

Entry Point D

Turn the machine off.
Disconnect the printer/display board.
Turn the machine on.
Press **Code + 1**.
Does the spell check beeper beep?

Yes No

Continued at D on the next page

Continued at C on the next page

C D

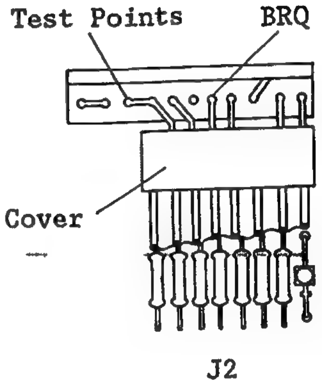
Does the spell check beeper beep when you press **Code** + **1** again?

Yes No

Turn the machine off.
Install a new SPELL CHECK BOARD.
Turn the machine on.
Does the spell check beep when you press **Code** + **1** two times?

Yes No

Turn the machine off.
Install the original SPELL CHECK BOARD.
Remove the cover from J2 on the Options Adapter board.
Do not disconnect J2.
If the cover is not removable, use the test points above the connector to make the following voltage check.
Turn the machine on.



Is there 3 to 5 VDC at

Level 1 J2-4 (BRQ)
Level 2,3 J2-7 (BRQ)

?

Yes No

Turn the machine off.
Disconnect J1P from the Printer board.
Turn the machine on.
Is there 3 to 5 VDC at J8F-3 (BRQ)?

Yes No

The FUNCTION BOARD is failing.

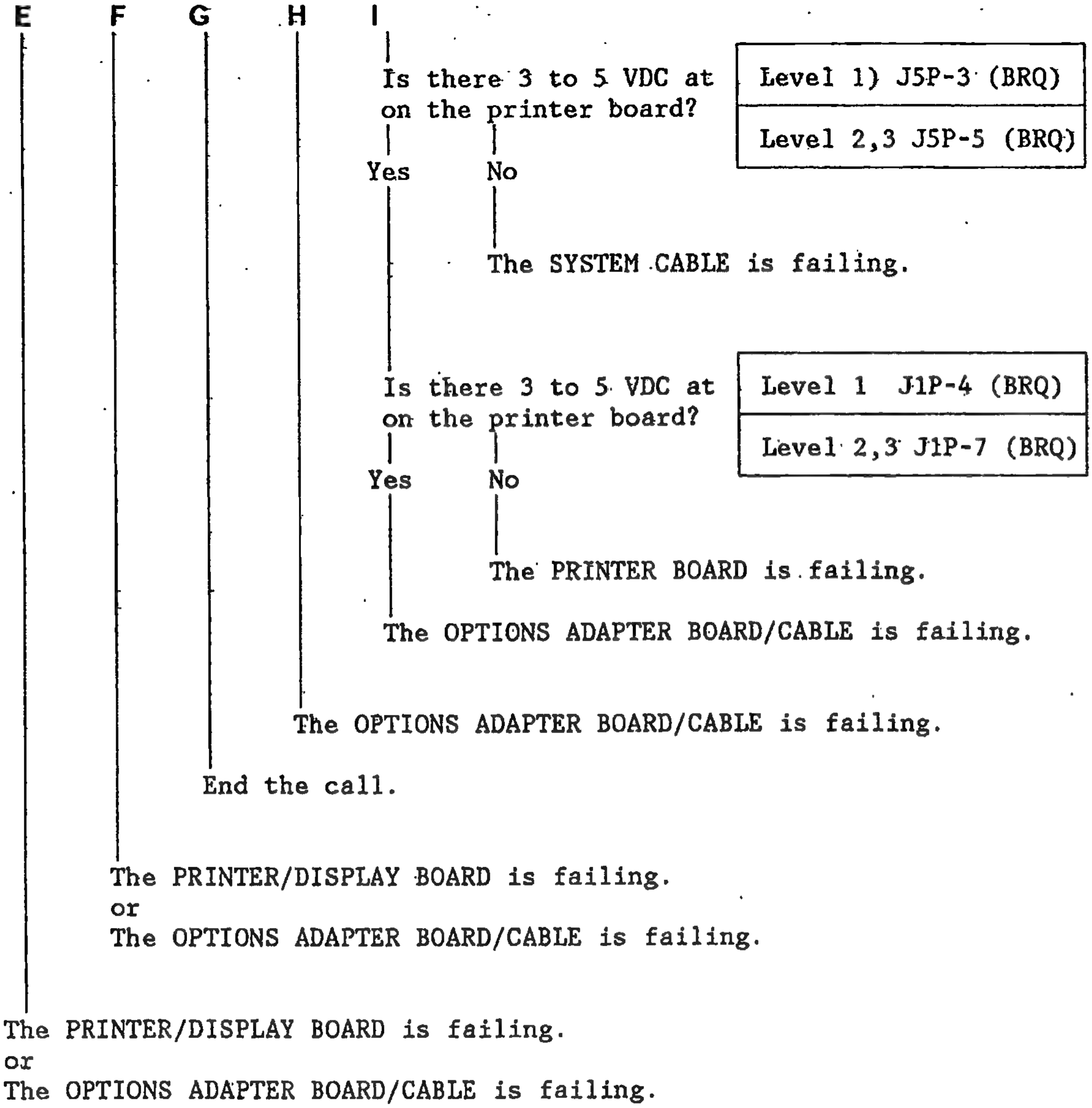
Continued at I on the next page

Continued at H on the next page

Continued at G on the next page

Continued at F on the next page

Continued at E on the next page



E F G H I

Is there 3 to 5 VDC at on the printer board?

Level 1) J5P-3 (BRQ)
Level 2,3 J5P-5 (BRQ)

Yes No

The SYSTEM CABLE is failing.

Is there 3 to 5 VDC at on the printer board?

Level 1 J1P-4 (BRQ)
Level 2,3 J1P-7 (BRQ)

Yes No

The PRINTER BOARD is failing.

The OPTIONS ADAPTER BOARD/CABLE is failing.

The OPTIONS ADAPTER BOARD/CABLE is failing.

End the call.

The PRINTER/DISPLAY BOARD is failing.
or
The OPTIONS ADAPTER BOARD/CABLE is failing.

The PRINTER/DISPLAY BOARD is failing.
or
The OPTIONS ADAPTER BOARD/CABLE is failing.

TRANSPORT DIAGNOSTIC

SYMPTOM	SEQUENCE OF FRU CHECKS 1	2	3	4
Carrier does not move.	D	C	B	
Transport is unstable or noisy Characters overlap Correction poor Horizontal alignment poor Margin changes	D	B	C	A
Noisy Transport	D	C	B	

Note: Turn the machine off when checking for binds in the transport assembly.

FRU CHECKS	CHECK FOR
A Bottom Cover	Bent or cracked Damaged, cracked, or hard frame latches (010-12)
B Carrier bearings and shaft	Correct lubrication Loose, or worn shaft Loose or worn bearings Carrier hitting feed rollers
C Transport Motor	Motor not running or noisy, GO TO the Transport Electrical Diagnostic, page 2-102. Binding shaft Loose mounting screws
D Transport Assembly	Binds or wear in the drive gear train and bearings Binds or wear in the idler gear bearing Binds or wear in the carrier bearings Belt: Adjustment, broken, or worn Belt clamp: Loose, worn, or broken Missing or bent load spring (520-4) or loose brackets Loose idler stud

TRANSPORT ELECTRICAL DIAGNOSTIC, Level 1, Level 2

Note: If your machine is a Wheelwriter 3, Level 3, go to the Transport Electrical Diagnostic, Level 3, page 2-104.

Tab to the right frame, then carrier return.
Does the transport motor operate correctly?

- Yes
  - Continued at A on the next page.
- No
  - **Turn the machine off.**
    Disconnect J2P from the Printer board.
    Set the meter on X1.
    Carefully zero the meter.
    Measure the resistance of the transport motor between the points indicated in the chart below (these are critical measurements).
    To ensure accurate measurements, the motor should be at room temperature. The resistance may be higher if the motor is hot.

Meter Connections	Reading
Blank	-
J2P-1 (EA+) to J2P-4 (EA)	4 to 6 ohms
J2P-2 (EC) to J2P-5 (EC+)	4 to 6 ohms
J2P-3 (EB+) to J2P-6 (EB)	4 to 6 ohms
J2P-2 (EC) to motor housing	Infinity
J2P-4 (EA) to motor housing	Infinity
J2P-6 (EB) to motor housing	Infinity
Blank	-

  - Are the measurements correct?
    - Yes
      - Continued at B on the next page.
    - No
      - Are any motor pins shorted to the motor housing?
        - Yes
          - The PRINTER BOARD and the TRANSPORT MOTOR are failing.
        - No
          - Check all the lines of the transport cable for continuity.
            Is there continuity?
            - Yes
              - The TRANSPORT MOTOR is failing.
            - No
              - The TRANSPORT CABLE is failing.

```
A       B
|       |
|       Were you sent to this diagnostic from the error indications diagnostic?
|       |       |
|       Yes     No
|       |       |
|       |       GO TO the Transport Diagnostic, page 2-101.
|       |       or
|       |       The PRINTER BOARD is failing.
|       |
|       |
|       The PRINTER BOARD is failing.
|
GO TO the Transport Diagnostic, page 2-101.
```

TRANSPORT ELECTRICAL DIAGNOSTIC, Level 3

Tab to the right frame, then carrier return.
Does the transport motor operate correctly?

Yes

No

Turn the machine off.
Disconnect J3P from the Printer board.
Set the meter on X1.
Carefully zero the meter.
Measure the resistance of the transport motor between the points indicated in the chart below (these are critical measurements). To ensure accurate measurements, the motor should be at room temperature. The resistance may be higher if the motor is hot.

Meter Connections	Reading
J3P-1 (EA+) to J3P-3 (EA)	4 to 10 ohms
J3P-2 (EB+) to J3P-4 (EB)	4 to 10 ohms
J3P-3 (EA) to motor housing	Infinity
J3P-2 (EB) to motor housing	Infinity
J3P-1 (EA+) to motor housing	Infinity
J3P-4 (EB) to motor housing	Infinity
Pin 1 to Pins 2 or 4	Infinity
Pin 2 to Pins 1 or 3	Infinity

Are the measurements correct?

Yes

No

Are any motor pins shorted to the motor housing?

Yes

No

Check all the lines of the transport cable for continuity.
Is there continuity?

Yes

No

The TRANSPORT CABLE is failing.

The TRANSPORT MOTOR is failing.

The PRINTER BOARD and the TRANSPORT MOTOR are failing.

Continued at B on the next page.

Continued at A on the next page.

A B

Were you sent to this diagnostic from the error indications diagnostic?

Yes No

GO TO the Transport Diagnostic, page 2-101.
or
The PRINTER BOARD is failing.

The PRINTER BOARD is failing.

GO TO the Transport Diagnostic, page 2-101.

TWO OPTION BOARDS DIAGNOSTIC

```
Is a Printer and/or a Display board installed?
|        |
Yes      No
|        |
|        Turn the machine on.
|        Press Code + 1.
|        Does the spell check beeper beep?
|        |       |
|       Yes      No
|        |       |
|        |       Press Code + 1 again.
|        |       Does the spell check beeper beep?
|        |       |       |
|        |      Yes      No
|        |       |       |
|        |       |       GO TO the Spell Check Option Diagnostics, page 2-94.
|        |       |
|        |       GO TO Entry Point A, below.
|        |
|        Entry Point A
|        |
|        Type zzz followed by a space.
|        Repeat at least 8 times.
|        Does the spell check beeper beep when you type zzz followed by a space?
|        |       |
|       Yes      No
|        |       |
|        |       GO TO the Spell Check Option Diagnostics, page 2-94.
|        |
|        Does the spell check beeper beep when you type the word a followed
|        by a space?
|        |       |
|       Yes      No
|        |       |
|        |       Does the operator indicate the supplemental
|        |       dictionary is losing words?
|        |       |       |
|        |      Yes      No
|        |       |       |
|        |       |       No failure found.  If you suspect operator error, GO TO the
|        |       |       What Happened? section of the
|        |       |       IBM WHEELWRITER, 6746, 6747, 6747-2
|        |       |       Options Operating Instructions.
|        |       |
|        |       GO TO the Spell Check Option Diagnostics, page 2-94.
|        |
|        GO TO the Spell Check Option Diagnostics, page 2-94.
|
```

Continued at A on the next page

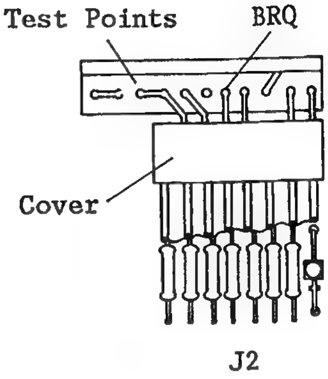
A

Turn the machine off.
Wait 30 seconds.
Turn the machine on.
Does the printer/display board LED turn on then go to off during the POR?

Yes — Continued at B on the next page.

No

  Turn the machine off.
  Remove the cover from J2 on the Options Adapter board.
  If the cover is not removable, use the test points above the connector to make the following voltage check.
  Do not disconnect J2.
  Turn the machine on.



  Is there 3 to 5 VDC at

Level 1	J2-4 (BRQ)
Level 2,3	J2-7(BRQ)

  on the top of J2?

  Yes — Continued at C on the next page.

  No

    Turn the machine off.
    Disconnect J1P from the Printer board.
    Turn the machine on.
    Is there 3 to 5 VDC at J8F-3 (BRQ) at the function board?

    No — The FUNCTION BOARD is failing.

    Yes

    Is there 3 to 5 VDC at

Level 1	J5P-3 (BRQ)
Level 2,3	J5P-5 (BRQ)

    on the printer board?

    No — The SYSTEM CABLE is failing.

    Yes

    Is there 3 to 5 VDC at

Level 1	J1P-4 (BRQ)
Level 2,3	J1P-7 (BRQ)

    on the printer board?

    No — The PRINTER BOARD is failing.

    Yes

    Continued at D on the next page.

  Continued at C on the next page.

Continued at B on the next page.

B C D

The OPTIONS ADAPTER BOARD/CABLE is failing.
or
The PRINTER/DISPLAY BOARD is failing.

GO TO Entry Point B, below.

Entry Point B

Is the Display installed?

Yes No

GO TO Entry Point C, below.

Turn the machine off.
Wait 30 seconds.
Turn the machine on.
Adjust the display contrast control from minimum to maximum.
Does the Display change from blank to dark lines?

Yes No

GO TO the Display Option Diagnostics, page 2-22.

Move the display mode switch to all positions.

-P (Print mode) = characters on Display only.
+P (Typewriter mode) = print as typed.
<┘P (Delayed print mode) = print when you end the line.

Do all the modes work?

Yes No

GO TO the Display Option Diagnostics, page 2-22.

Do the characters appear on the display correctly?

Yes No

GO TO the Display Option Diagnostics, page 2-22.

Continued at E on the next page

E

Entry Point C

Is the Printer Option installed?

Yes No

No failure found. If you suspect operator error, GO TO the What Happened? section of the IBM WHEELWRITER, 6746, 6747, 6747-2 Options Operating Instructions.

Do all of the following occur when you press **Code + 5**:
Printwheel rotates?
Platen moves down and up?
Line space 1-1/2, 2, and 3 LEDs turn on?

Yes No

GO TO the Printer Option Diagnostics, page 2-70.

Turn the machine off.
Note the position of the line feed DIP switch, then turn it off.
Install the wrap plug.
Turn the machine on.
Does the printer/display board LED turn on?

Yes No

The PRINTER/DISPLAY BOARD is failing.
or
The OPTIONS ADAPTER BOARD/CABLE is failing.
Move the line feed DIP switch, to its original position.
Install the printer cable in J1D.

Move the line feed DIP switch to its original position.
Remove the wrap plug.
Is the operator available to run a printout from the computer?

Yes No

End the call. There may still be a Printer Option problem which will need an operator's help to diagnose.

Can you identify a symptom with the operator's help?

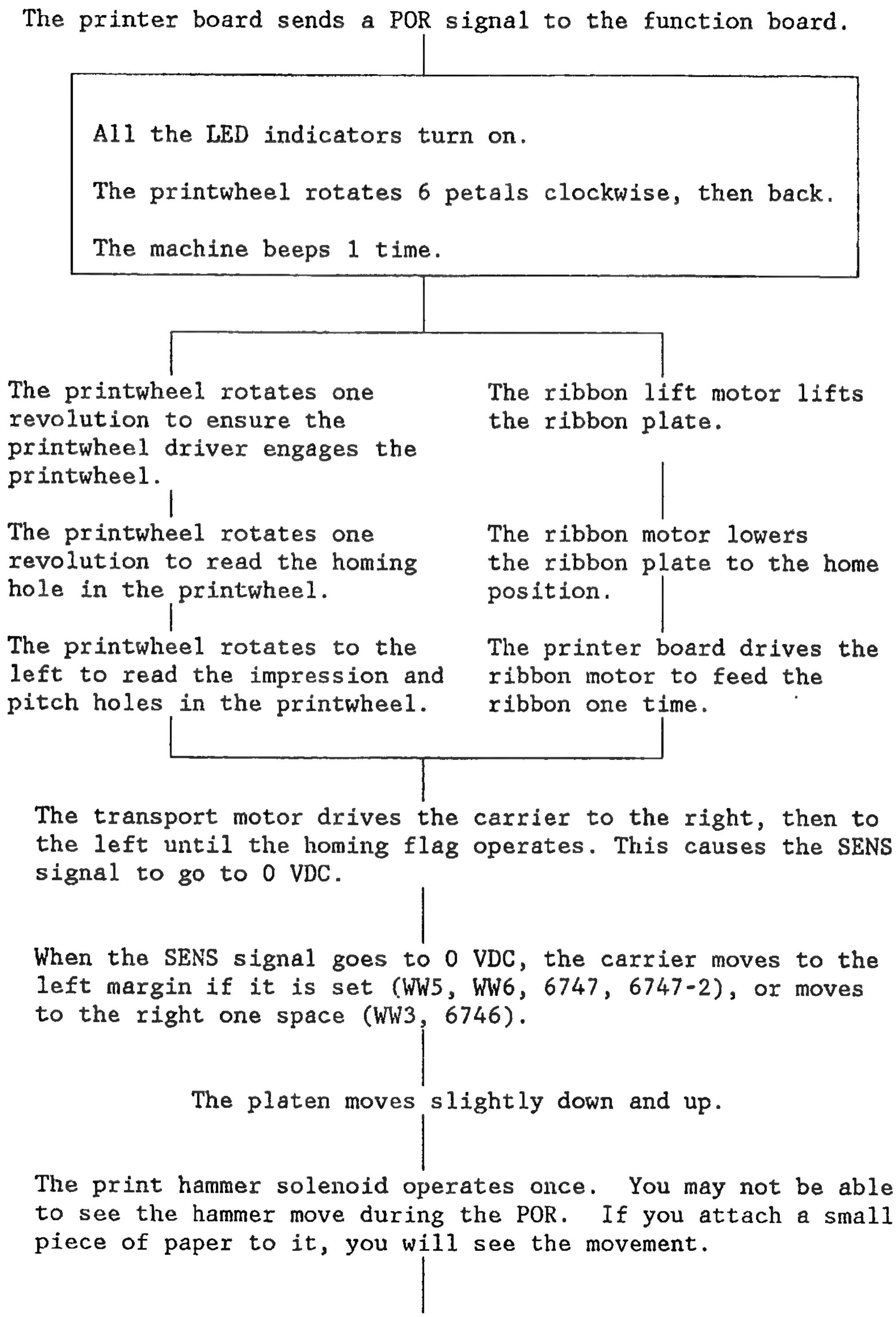
Yes No

No failure found. If you suspect operator error, GO TO the What Happened? section of the IBM WHEELWRITER, 6746, 6747, 6747-2 Options Operating Instructions.

GO TO the Printer Option Diagnostics, page 2-70.

DIAGNOSTIC AIDS

POWER ON RESET (POR) SEQUENCE



The printer board sends a POR signal to the function board.

All the LED indicators turn on.

The printwheel rotates 6 petals clockwise, then back.

The machine beeps 1 time.

The printwheel rotates one revolution to ensure the printwheel driver engages the printwheel.

The printwheel rotates one revolution to read the homing hole in the printwheel.

The printwheel rotates to the left to read the impression and pitch holes in the printwheel.

The ribbon lift motor lifts the ribbon plate.

The ribbon motor lowers the ribbon plate to the home position.

The printer board drives the ribbon motor to feed the ribbon one time.

The transport motor drives the carrier to the right, then to the left until the homing flag operates. This causes the SENS signal to go to 0 VDC.

When the SENS signal goes to 0 VDC, the carrier moves to the left margin if it is set (WW5, WW6, 6747, 6747-2), or moves to the right one space (WW3, 6746).

The platen moves slightly down and up.

The print hammer solenoid operates once. You may not be able to see the hammer move during the POR. If you attach a small piece of paper to it, you will see the movement.

Continued on the next page

POWER ON RESET (POR) SEQUENCE (Contd)

The printwheel rotates 180 degrees to the right,
then 180 degrees to the left (WW5, WW6, 6747, 6747-2 only).

All the indicator LEDs turn off except the linespace 1 indicator.

Power On Reset (POR) complete.

If the machine detects a failure during the Power On Reset (POR), the machine beeps 6 times and the indicator panel displays an error code.

PLAY-IN-LOOP (WW3 6746 Typewriter)

To run the Play-In-Loop:

1. Press and hold both the code and the shift keybuttons while you press the right margin set keybutton.
2. Type the test words that you want to use.
3. Press and hold both the code and the shift keybuttons while you press the right margin set keybutton.
4. The words will play in loop until you interrupt it.
5. Press any keybutton to interrupt play-in-loop.
6. Press the code keybutton to start play-in-loop again.
7. Press any keybutton except the code keybutton to leave the play-in-loop mode.

Play-In-Loop ignores the following functions:

- Centering
- Erase.

PLAY-IN LOOP (WW5, WW6, 6747, 6747-2 Typewriter)

To run the Play-In-Loop:

1. Press and hold the store keybutton while you press the number of an open storage area.
2. Type the test words that you want to use.
3. Press and hold both the code and the shift keybuttons while you press the right margin set keybutton.
4. Play the words that you stored.
   The phrase will play in loop.

Note:
Delete your test words when you complete the test.

Play-In-Loop ignores the following functions:

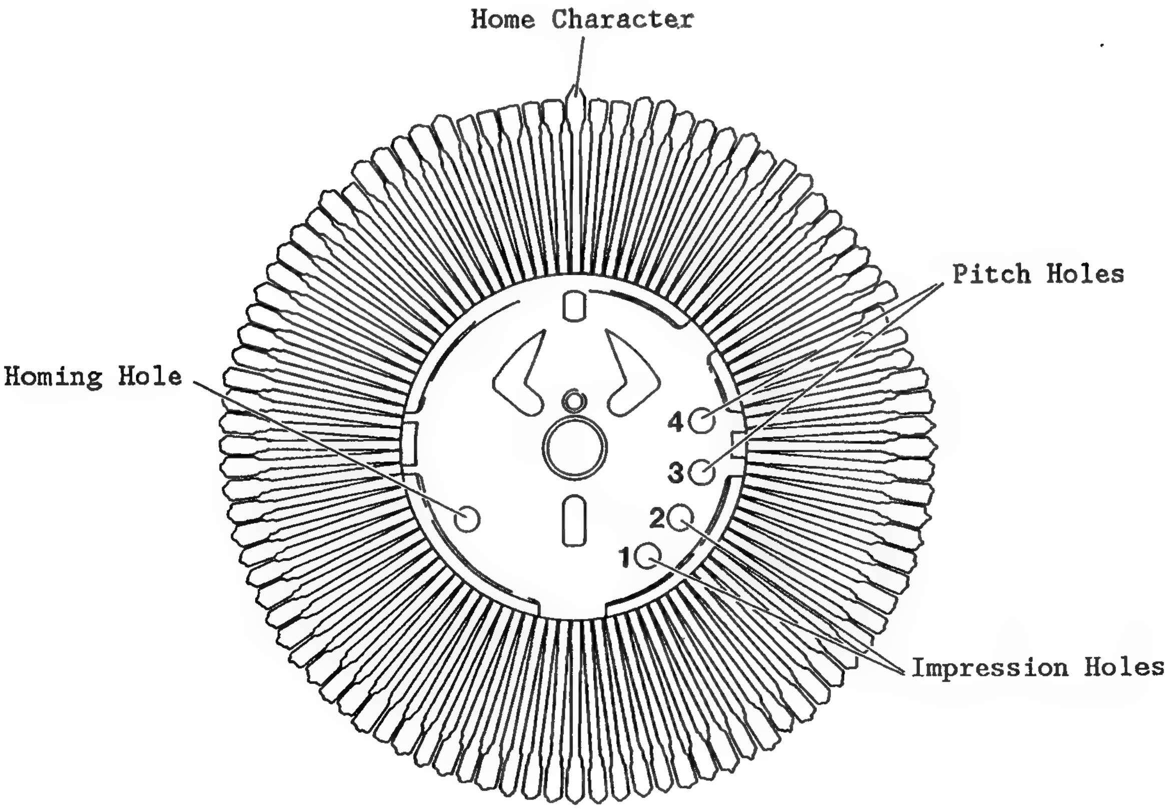
- Centering
- Dec. Tab
- Erase.

WRAP MODE CHECK

1. Turn the typewriter off.
2. Disconnect the printer cable from J1D.
3. Note the position of the line feed DIP switch. and turn it off for this test.
4. Install the wrap plug in J1D.
5. Turn the typewriter on.
6. Check the printer/display board LED.
    - If the LED turns on, then turns off, the PRINTER OPTION BOARD is failing.
    - If the LED turns on and remains on, the Printer Option is good.
7. Turn the typewriter off.
8. Remove the wrap plug.
9. Set the line feed DIP switch to its original position.
10. Install the printer cable in J1D.

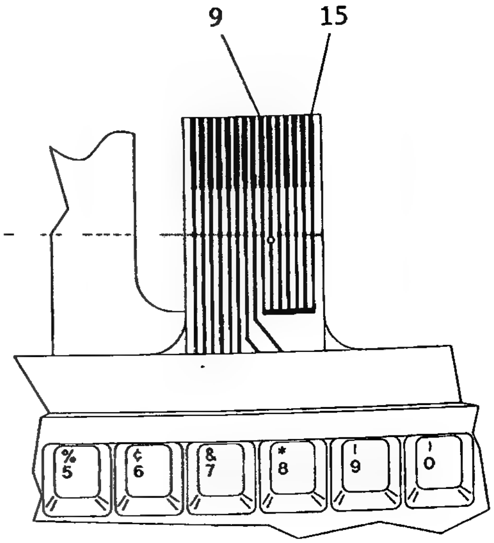
PRINTWHEEL CODE CHART

HOLE CODE					
1	2	3	4	Pitch	IMPRESSION
				10	Light
0				10	Medium
	0			10	Heavy
		0	0	12	Light
0		0	0	12	Medium
	0	0	0	12	Heavy
			0	15	Light
0			0	15	Medium
	0		0	15	Heavy
		0		PS	Light
0		0		PS	Medium
	0	0		PS	Heavy



KEYBOARD IDENTIFICATION CHART

KEYBOARD NAME	HOLE CODE					
	10	11	12	13	14	15
Argentina						0
Australia/New Zealand	0	0			0	
Austria			0		0	0
Belgium/France			0		0	
Bulgaria					0	0
Canada (Bilingual)				0		
Canada (English)				0		0
Czechoslovakia (Czech)				0	0	
Czechoslovakia (Slovak)				0	0	0
Denmark				0		
Finland/Sweden			0			0
Germany (East)					0	
Germany (West)			0		0	0
Greece (Greek)			0	0		
Hong Kong			0	0		0
Hungary			0	0	0	
Iceland			0	0	0	0
Italy		0				
Italy (Inches)	0	0				
Japan (English)		0				0
Japan (Katakana)		0				0
Latin American tab,		0			0	0
Latin American tab.	0			0	0	
Netherlands		0		0		
Norway		0		0		0
Poland		0		0	0	
Portugal		0		0	0	0
Rumania		0	0			
South Africa		0	0			0
Spain		0	0		0	
Switzerland (French)		0	0	0		
Switzerland (German)		0	0	0		0
Turkey		0	0	0	0	
U.K./Ireland		0	0	0	0	0
United States						
U.S.S.R.	0					
Yugoslavia (Latin)	0				0	



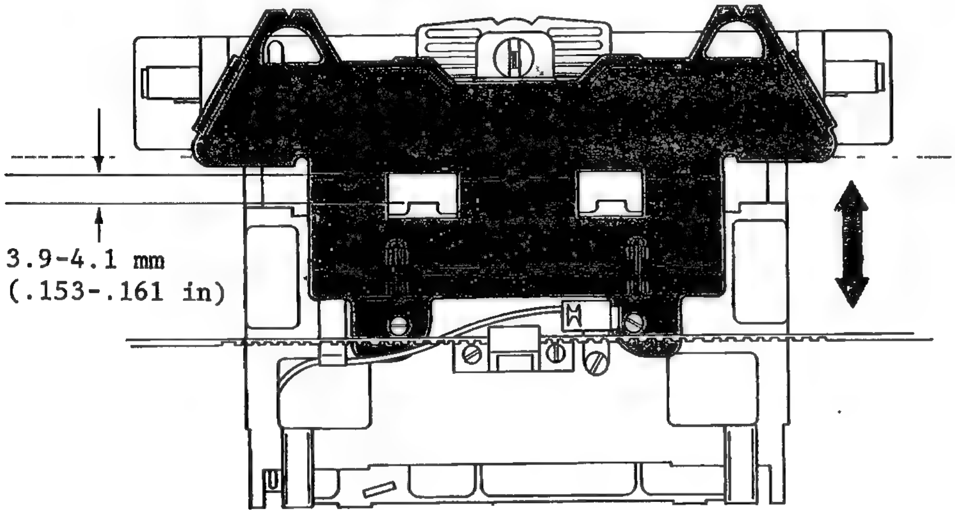
Keyboard ID Lines

REPAIR INFORMATION

ADJUSTMENTS

CARDHOLDER ADJUSTMENT

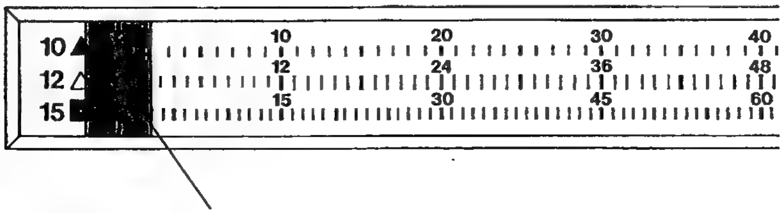
Position the cardholder so it clears the lugs on the back of the carrier by 3.9 to 4.1 mm (.153 to .161 in).



(Rear View)

CARRIER POINTER ADJUSTMENT

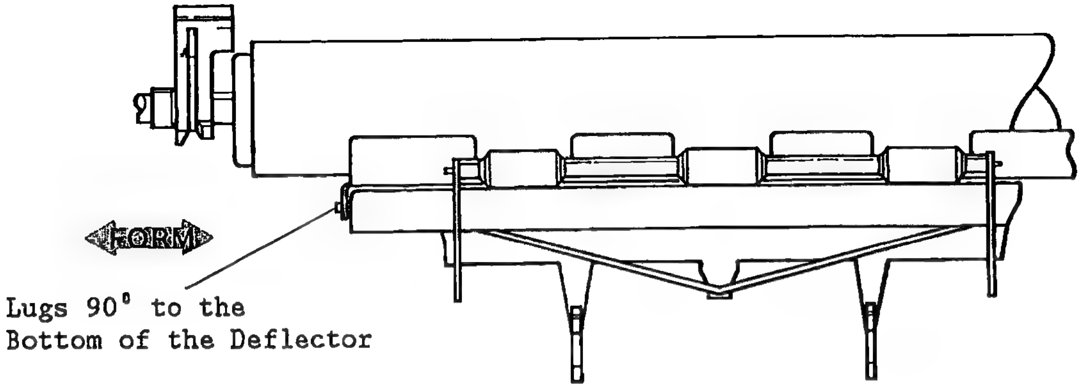
Form the pointer so the line on the front of it aligns with the zeros on the margin scale. Check positions 70 and 100 also. Distribute the tolerances between 0 and 70.



FORM

DEFLECTOR ADJUSTMENT

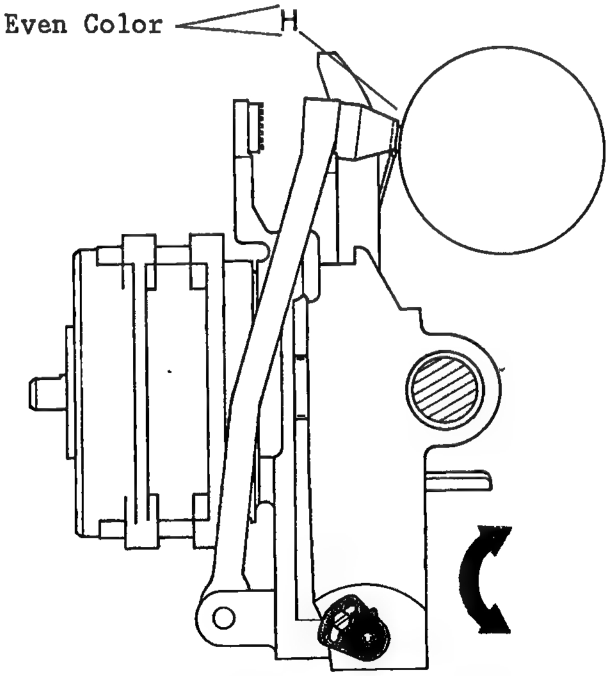
Form the deflector lugs so they are 90° to the bottom of the deflector.



(Front View)

EVEN TOP AND BOTTOM PRINTING ADJUSTMENT

1. Check the platen bushings for wear before you make this adjustment.
2. Adjust the selection plate eccentrics for even top and bottom printing.

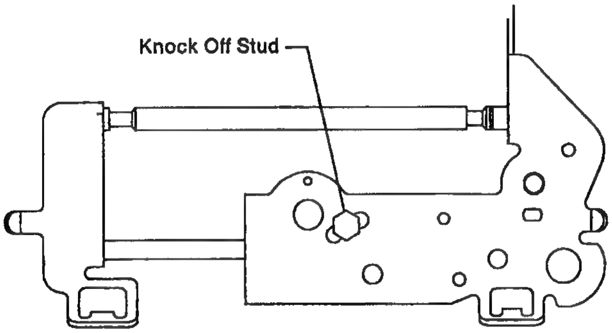


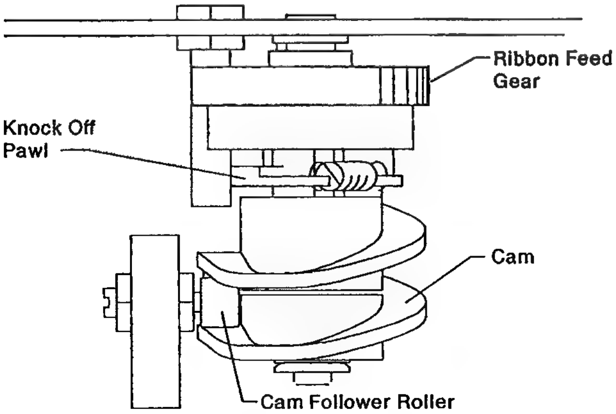
(Right Side View)

RIBBON LIFT KNOCK-OFF ADJUSTMENT, Level 3

The ribbon lift adjustment must be correct before making this adjustment. Make this adjustment with the ribbon plate installed.

1. Loosen the nut on the bottom of the knock-off stud. You may need to move the carrier position indicator to the side.
2. Hold the rear of the ribbon plate down and rotate the ribbon feed gear counterclock wise until the cam stops moving.
3. Adjust the knock-off to the left or right until the knock-off (black) pawl is clearly disengaged from the gear and there is a clearance of .5 to 1 mm (.020 to .04 in) between the cam follower roller and the end of the cam track. Rotate the cam by hand to check for this clearance.
4. Tighten the nut and check the adjustment. To check the adjustment, turn the ribbon feed gear counterclock wise. If it binds or stops turning, the adjusting stud is too far to the left in the slot. The white pawl will continue to ratchet as you rotate the gear. The black pawl must disengage. Readjust if necessary.
5. The gear should turn smoothly and the plate should not jump as you hold the rear of the ribbon plate down and rotate the gear. If it does not turn smoothly, the adjusting stud is too far to the right in the slot.



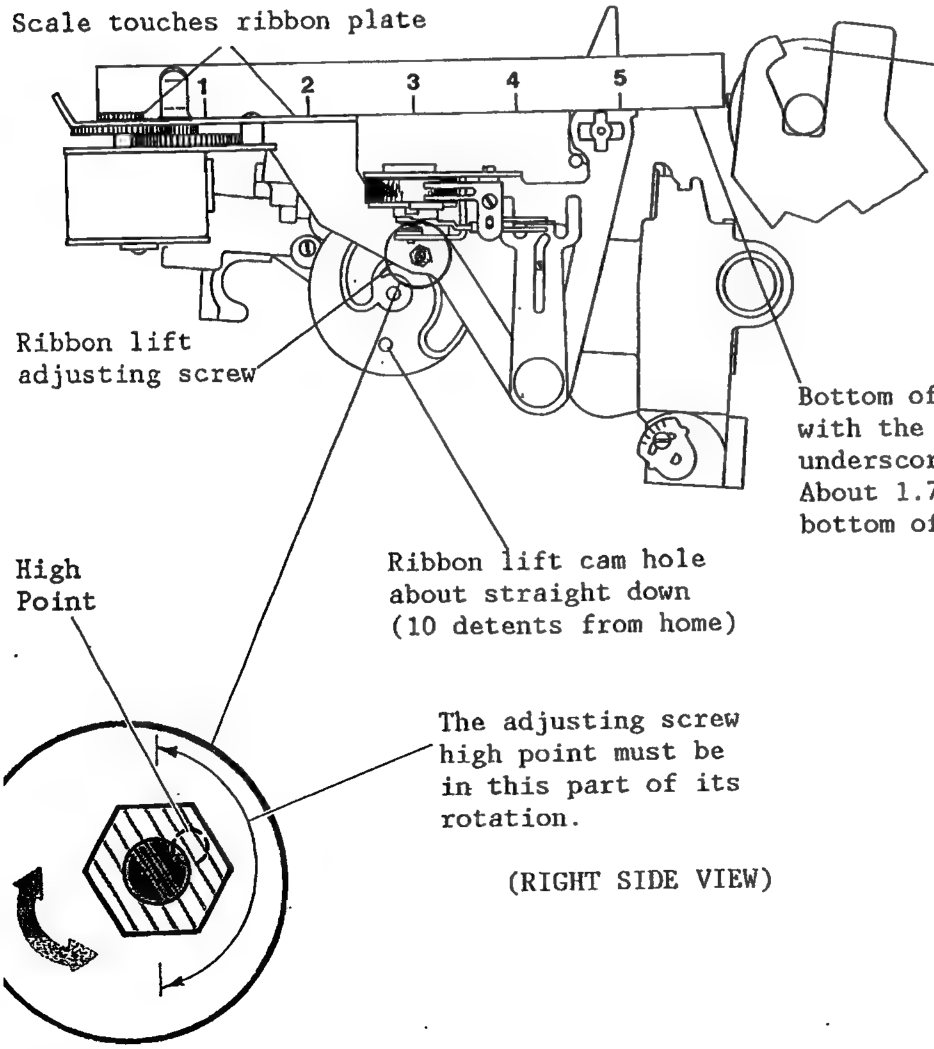


RIBBON LIFT ADJUSTMENT, Level 1 and 2

Adjust the ribbon lift adjusting screw so the underscore prints approximately 1.7 mm (.067 in) from the bottom edge of the ribbon.

Note: Ensure the adjusting screw high point is in the rear half of its orbit.

1. **Turn the machine on and leave it on while you make this adjustment.**
2. Type a line of underscores.
3. Press micro down 1 time.
4. Backspace the carrier until you can rotate the ribbon lift gear. Also ensure that 10 mm (.400 in) or more of the line of underscores is past the right end of the cardholder.
5. Rotate the ribbon lift cam top to the front until the hole in it is about straight down (10 detents from home).
6. Position a scale on the right end of the ribbon plate and press down on the correcting tape feed ratchet hard enough to remove the backlash in the ribbon lift mechanism.
7. Adjust the ribbon lift adjusting screw so the bottom of the scale aligns with the bottom of the underscore inside .25 mm (.010 in).



Scale touches ribbon plate

Platen micro down 1 time.

Ribbon lift adjusting screw

Bottom of scale aligns with the bottom of the underscore ± .25 mm (.010 in) About 1.7 mm (.067 in) from bottom of ribbon.

High Point

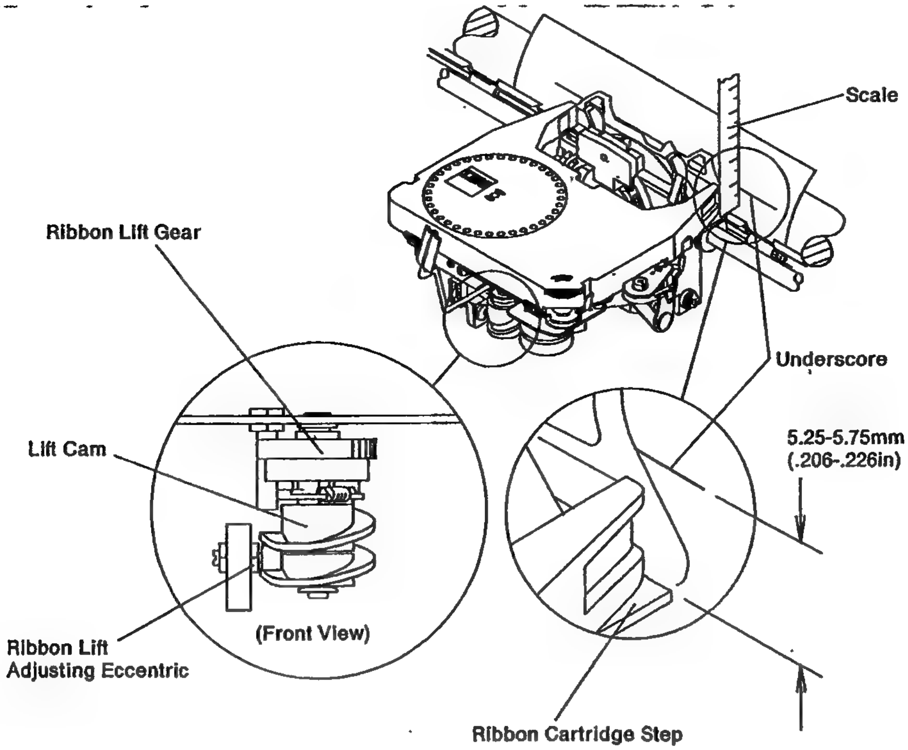
Ribbon lift cam hole about straight down (10 detents from home)

The adjusting screw high point must be in this part of its rotation.

(RIGHT SIDE VIEW)

RIBBON LIFT ADJUSTMENT, Level 3

1. Turn the machine on and leave it while you make this adjustment.
2. Remove the correction cartridge and reinstall the ribbon cartridge by itself.
3. Type a line of underscores.
4. Backspace the carrier until at least 10 mm (0.4 in) of the line of underscores is visible to the right of the cardholder.
5. Rotate the ribbon lift gear counterclock wise until the lift cam stops turning.
6. Use a scale to measure the vertical distance between the top of the step on the ribbon cartridge and the line of underscores. The distance should be 5.25 to 5.75 mm (.206 to .226 in).
7. Adjust the ribbon lift adjusting eccentric for a clearance of 5.25 to 5.75 mm (.206 to .226 in) between the step on the cartridge and the line of underscores.
8. Check the ribbon lift knock-off adjustment and correct it if necessary. See page 3-3.

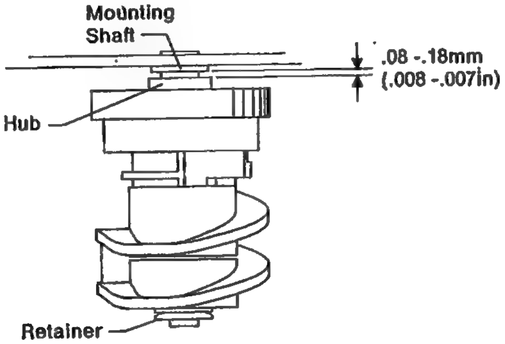


RIBBON LIFT CAM END-PLAY ADJUSTMENT, Level 3

Make this adjustment whenever you replace the retainer.

Adjust the ribbon lift cam retainer up or down for a clearance of .08 to .18 mm (.003 to .007 in) between the shoulder of the mounting shaft and the hub on the top of the gear.

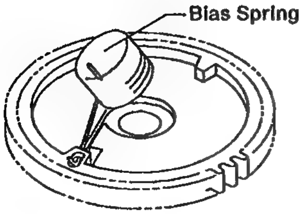
Note: The retainer can only be pushed in one direction. To make the adjustment, place a feeler gauge between the shoulder of the mounting shaft and the hub on the top of the gear, then push the retainer up on the shaft until the parts are pushed against the feeler gauge.

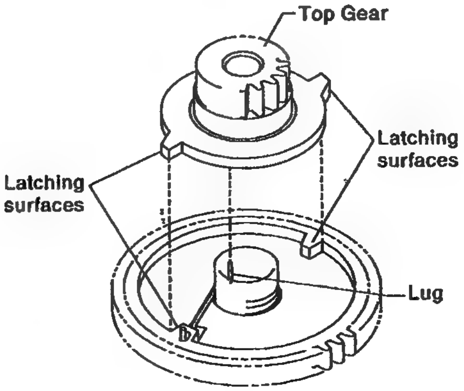


RIBBON FEED GEAR BIAS SPRING ADJUSTMENT, Level 3

1. Install the spring in the bottom gear as shown.
2. Place the top gear over the bias spring as shown. The vertical lug on the spring must fit into one of the holes inside the top gear.
3. Rotate the top gear 1/2 turn clockwise and latch it in place. The spring should load the latching surfaces of the two gears against each other. Hold the gears in place until you have installed the ribbon feed motor in the machine. The spring will unwind if you do not hold the gears together.

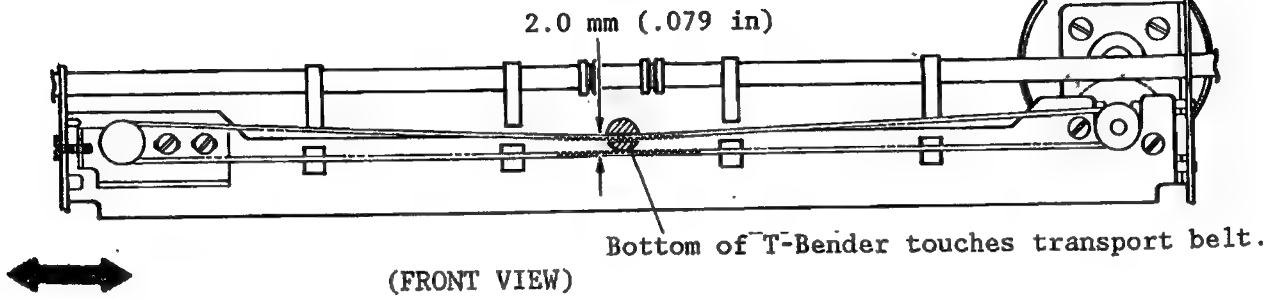
Note: After you have installed the motor, rotate the top gear 1/4 turn clockwise and let go. The gear should return to the initial position.





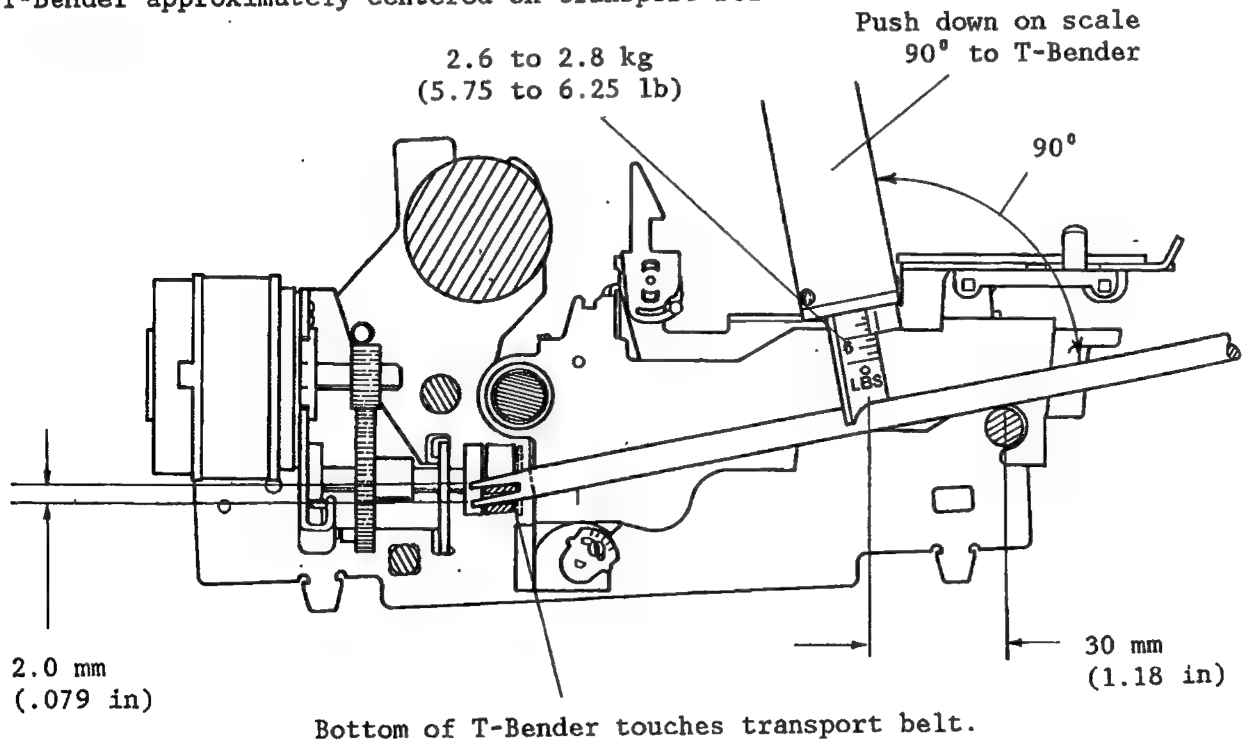
TRANSPORT BELT ADJUSTMENT, Level 1, Level 2

Move the carrier all the way to the right. Set the keyboard height to its lowest position. Loosen the idler pulley bracket mounting screws. Slide the T-Bender on the top transport belt at the center of the belt. Rest the T-Bender on the carrier shaft. Hold the scale 90 degrees to the T-Bender. Put 2.6 to 2.8 kg (5.75 to 6.25 lb) pressure on the T-Bender 30 mm (1.18 in) from the center of the carrier shaft. Turn the adjusting screw in or out so the bottom of the T-Bender touches the transport belt.



(FRONT VIEW)

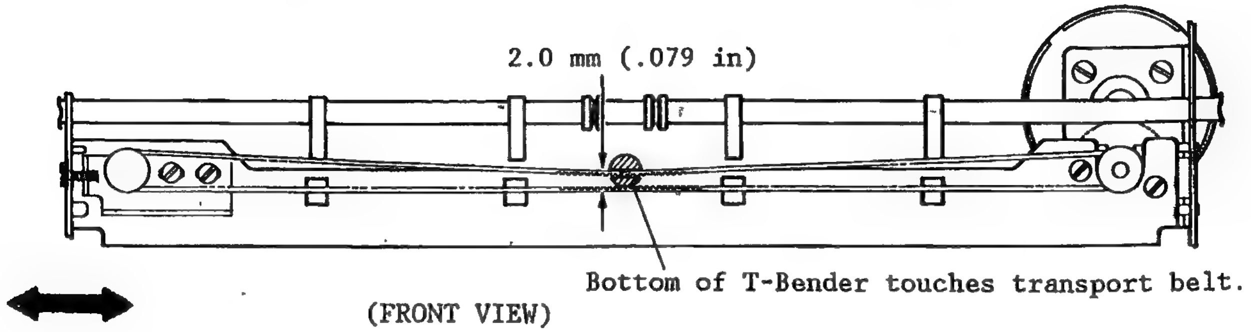
T-Bender approximately centered on transport belt


Push down on scale 90° to T-Bender
2.6 to 2.8 kg (5.75 to 6.25 lb)
90°
LBS
2.0 mm (.079 in)
30 mm (1.18 in)
Bottom of T-Bender touches transport belt.

(LEFT SIDE VIEW)

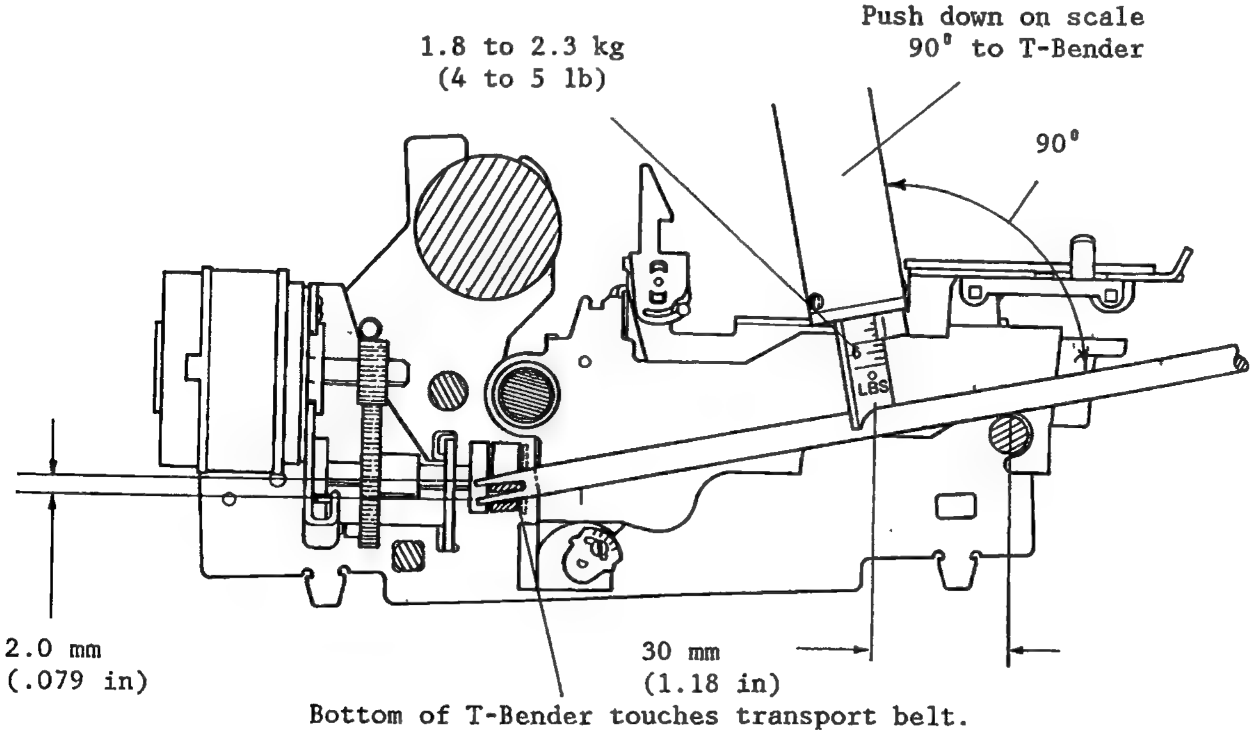
TRANSPORT BELT ADJUSTMENT, Level 3

Move the carrier all the way to the right. Set the keyboard height to its lowest position. Loosen the idler pulley bracket mounting screws. Slide the T-Bender on the top transport belt at the center of the belt. Rest the T-Bender on the carrier shaft. Hold the scale 90 degrees to the T-Bender. Put 1.8 to 2.3 kg (4 to 5 lb) pressure on the T-Bender 30 mm (1.18 in) from the center of the carrier shaft. Turn the adjusting screw in or out so the bottom of the T-Bender touches the transport belt.



(FRONT VIEW)

T-Bender approximately centered on transport belt



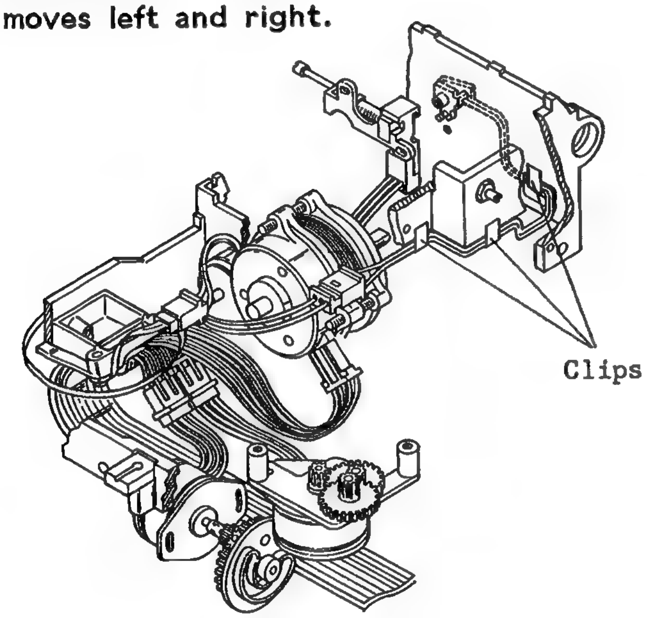
(LEFT SIDE VIEW)

REMOVALS AND INSTALLATIONS

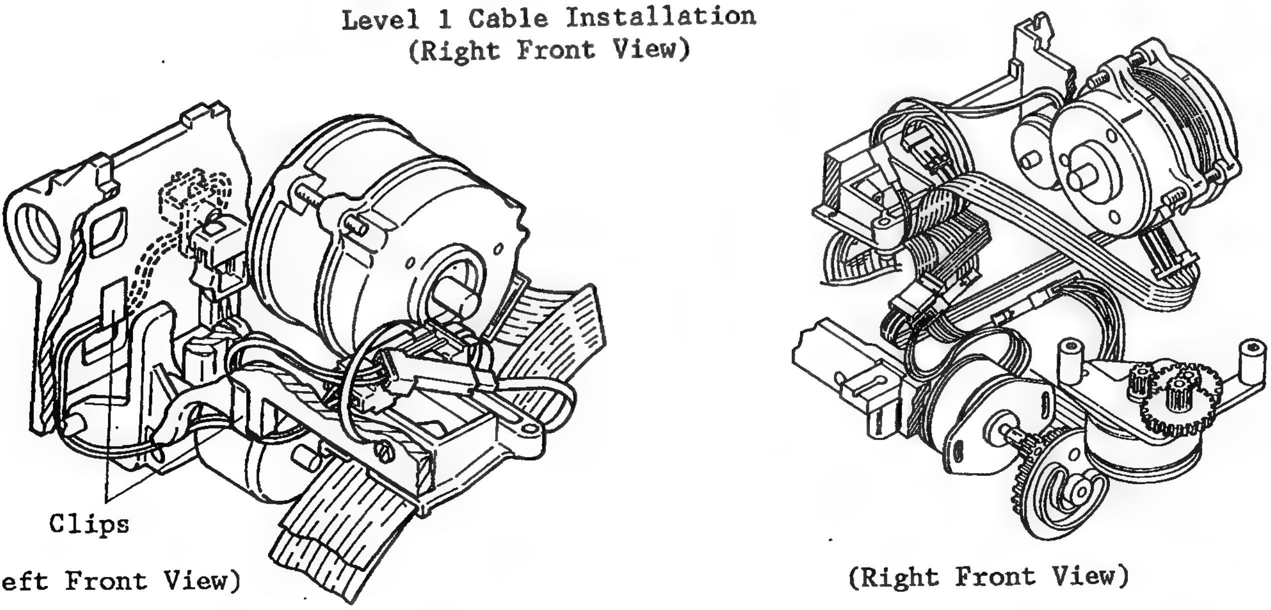
CARRIER CABLE INSTALLATION

1. Install and tighten the cable clamp screw (300-23).
2. Connect the homing LED connector.
3. Position the cables as shown in the level 1 or level 2 cable installation diagram.

CAUTION
Make sure that all the cables are away from the parts in the bottom cover as the carrier moves left and right.



Level 1 Cable Installation
(Right Front View)



(Left Front View)

(Right Front View)

Level 2 Cable Installation

CARRIER ASSEMBLY REMOVAL

1. Remove the top cover.
2. Roll the transport belt from its pulleys. Do not use tools to do this.
3. Disconnect J4P.
4. Notice how the carrier cable is held in the bottom cover, then loosen it and work it out from under the transport bracket (520-13).
5. Use a 1/4" wrench to rotate the carrier shaft (500-20) about 1/8 turn top to rear to release it.
6. Push the shaft to the right far enough so it is away from the left side frame.
7. Lift and pull the left end of the carrier shaft to the front, then pull the shaft and carrier to the left to clear the right side frame.
8. Pull the carrier shaft out of the right side of the carrier.

FEED ROLLER ASSEMBLY REMOVAL

1. Remove the:
   - Top Cover
   - Platen
   - Deflector
   - Feed roller assembly retainer (230-18) on non-U.S. machines only.
2. Push down on the feed roller assembly (230-4 or 230-5) until the lower ends of the roller assemblies release from the transport bracket (520-13).
3. Rotate the feed roller assembly (230-4 or 230-5) forward, then lift it out of the machine.

FRAME ASSEMBLY REMOVAL

1. Remove the:
   - Top cover
   - Platen
   - Deflector
   - Feed roller assemblies
   - Transport motor cable (300-6)
   - Carrier
   - Semi-automatic paper insertion (SAPI) switch (230-11)
   - Power supply cover (600-3). Level 1 only.
2. Disconnect J3P.
3. Disconnect the frame common wire (300-8) from the right side frame (Level 1 only).
4. Release the front frame latches (010-12) and lift the front of the frame and rest it on top of the frame latches.
5. Release the rear frame latches (010-12) and lift the frame out of the bottom cover.
6. Remove the:
   - Transport ASSEMBLY
   - Paperfeed motor assembly
   - Transport mounting bracket (520-13).

Note: When installing the frame be careful not to trap any of the wires under the frame or in the frame latches.

FUNCTION BOARD REMOVAL

Note: Leave the battery connected to the function board if you remove the board from a machine and then put it back into the machine (W5, WW6, 6747, and 6747-2). This will ensure that memory is not lost.

1. **Turn the machine off.**
2. Move the carrier to the left side frame.
3. Disconnect:
   - J1F
   - J2F
   - J5F
   - J6F
   - J8F
   - J9F
4. Remove the function board cover.
5. Remove the function board mounting screws.
6. Lift the function board out of the machine.
7. Reinstall in reverse order. Ensure the function board shield is installed on level 1 machines.

CAUTION
Ensure that you do not reverse J7F (battery back-up) and J9F (keyboard common wire) on the WW5 and 6747 Typewriter (Level 1).

HOMING LED REMOVAL

1. Remove the carrier.
2. Disconnect the homing LED connector.
3. There are 3 retainers (level 1), or 2 retainers (Level 2, 3), that hold the homing LED cable in place. Ensure that you install them correctly when you install the homing LED. Remove the retainers (500-19).
4. Remove the homing LED mounting screw (500-15).
5. Remove the homing LED.
6. See the carrier cable installation procedure, page 3-9 for the correct way to install the LED wires.

INDICATOR PANEL ASSEMBLY REMOVAL

1. Remove the top cover.
2. Disconnect J5F.
3. Pull the bottom of the 2 retainers on the rear of the keyboard cover (010-14) to the rear to release the rear of the keyboard cover.
4. Lift the rear of the keyboard cover slightly, then slide it off toward the front.
5. Turn the keyboard cover over, press one side of the indicator panel (040-5) with your fingers and work it out of the keyboard cover.

KEYBOARD REMOVAL, Level 1

1. Remove the top cover.
2. Disconnect:
   - J1F
   - J2F
   - J5F.
3. Pull the bottom of the 2 retainers on the rear of the keyboard cover (010-14) to the rear to release the rear of the keyboard cover.
4. Lift the rear of the keyboard cover slightly, then slide it off toward the front.
5. On the WW5 and 6747 Typewriter, remove the 2 keyboard common wire mounting screws (300-11).
6. On the WW3 6746 Typewriter, remove the keyboard common wire mounting screw (300-11).
7. Lift the rear of the keyboard to a vertical position.
8. Spread the keyboard pivots just enough to release the keyboard, then lift the keyboard out of the cover.

KEYBOARD REMOVAL, Level 2, 3

1. Remove the top cover.
2. Disconnect:
   - J1F
   - J2F
   - J5F.
3. Pull the bottom of the 2 retainers on the rear of the keyboard cover (010-14) to the rear to release the rear of the keyboard cover.
4. Lift the rear of the keyboard cover slightly, then slide it off toward the front.
5. Lift and slide the keyboard out of the left and right retainer clips (040-08).
6. Remove the keyboard from the bottom cover.
7. Note how the keyboard bail is installed if you need to remove it.

ON/OFF SWITCH ASSEMBLY REMOVAL, Level 1

1. **Disconnect the machine from the AC outlet.**
2. Remove the 3 mounting screws (600-9).
3. Remove the external common wire mounting screw (300-20).
4. Disconnect the transformer connector.
5. Lift the ON/OFF switch assembly out of the machine.

ON/OFF SWITCH ASSEMBLY REMOVAL, Level 2, 3

1. **Disconnect the machine from the AC outlet.**
2. Remove the 2 mounting screws from the left side.
3. Lift the switch housing up.
4. Remove the pin from the switch handle and remove the handle.
5. Release the switch latches by inserting meter leads into the two openings at the bottom of the switch housing.
6. Remove the switch.

PAPERFEED MOTOR ASSEMBLY REMOVAL

1. Remove the:
    - Top cover and Platen
    - Power supply cover (600-3), Level 1
    - Paperfeed motor tension spring (230-22)
    - 2 front paperfeed motor mounting screws (230-21).
2. Disconnect:
    - J3P
    - The transformer connector.
3. Move the paperfeed motor to the rear and lift it out of the machine.

POWER SUPPLY REMOVAL, Level 1

1. **Disconnect the machine from the AC outlet.**
2. Remove the power supply cover (600-3).
3. Disconnect:
    - Transformer connector
    - J3P
    - J6P
4. Remove the external common wire mounting screw (300-20) from the ON/OFF switch assembly.
5. Remove the external common wire mounting screw (300-7) located below J6P.
6. Remove the keyboard common wire mounting screw (300-11) located on the left side of the keyboard.
7. Remove the 2 mounting screws (600-6).
8. Lift the right end of the power supply up a little and move it to the right to remove it.

POWER SUPPLY REMOVAL, Level 2, 3

1. **Disconnect the machine from the AC outlet.**
2. Disconnect J6P.
3. Remove the 2 on/off switch mounting screws (600-12).
4. Remove the paperfeed motor wires from the clip on the power supply cover.
5. Remove the left-front and right-rear power supply mounting screws (600-16).
6. Lift the power supply straight up.
7. Before you install the new assembly, remove the grounding strap from the left-rear transformer mounting screw and install it at the power supply grounding clip.

POWER SUPPLY BOARD REMOVAL, Level 2, 3

1. Remove the power supply.
2. Disconnect the transformer, J2.
3. Remove the grounding strap from the transformer mounting screw.
4. Remove the 4 board mounting screws.
5. Remove the board to the rear.
6. When you install a new board, install the grounding strap to the right-rear transformer mounting screw (600-14).

PRINTER BOARD REMOVAL, Level 1

1. TURN THE MACHINE OFF.
2. Disconnect J1P from the printer board if it is connected.
3. Remove the top cover.
4. Disconnect:
    - J2P
    - J3P
    - J4P
    - J5P
    - J6P
5. Remove the 2 retainers (300-3) from the heatsink.
6. Pull the printer board straight up to remove it.

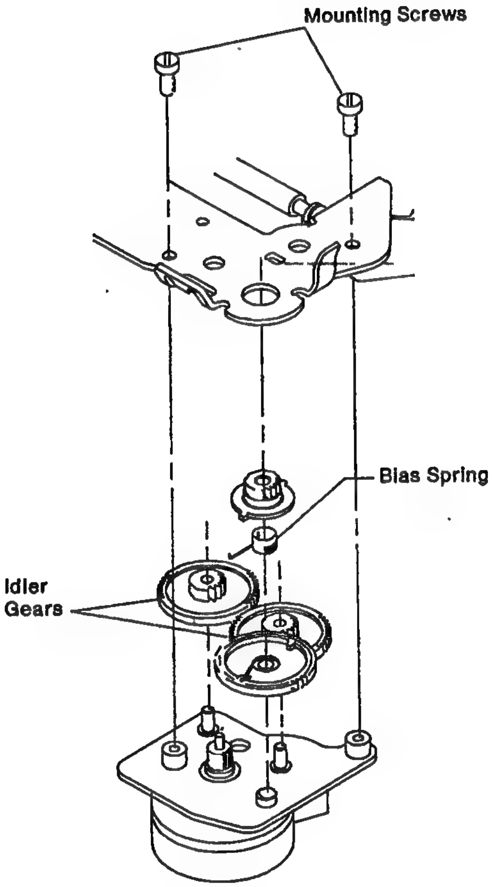
PRINTER BOARD REMOVAL, Level 2, 3

1. Turn the machine off.
2. Disconnect J1P from the printer board if it is connected.
3. Remove the top cover.
4. Disconnect:
    - J2P
    - J3P
    - J4P
    - J5P
    - J6P
5. Remove the 2 printer board bracket mounting screws (300-4C).
6. Remove the printer board assembly.

RIBBON FEED MOTOR REMOVAL, Level 3

1. Remove the two motor mounting screws.
2. The ribbon feed gear bias spring is under tension and may fall out of the gears. Carefully remove the feed motor assembly from the ribbon plate.

Note: When you install the ribbon feed motor, the idler gears must be installed with the small gear on top. You must also make the ribbon feed gear bias spring adjustment, page 3-6.



RIBBON LIFT CAM INSTALLATION

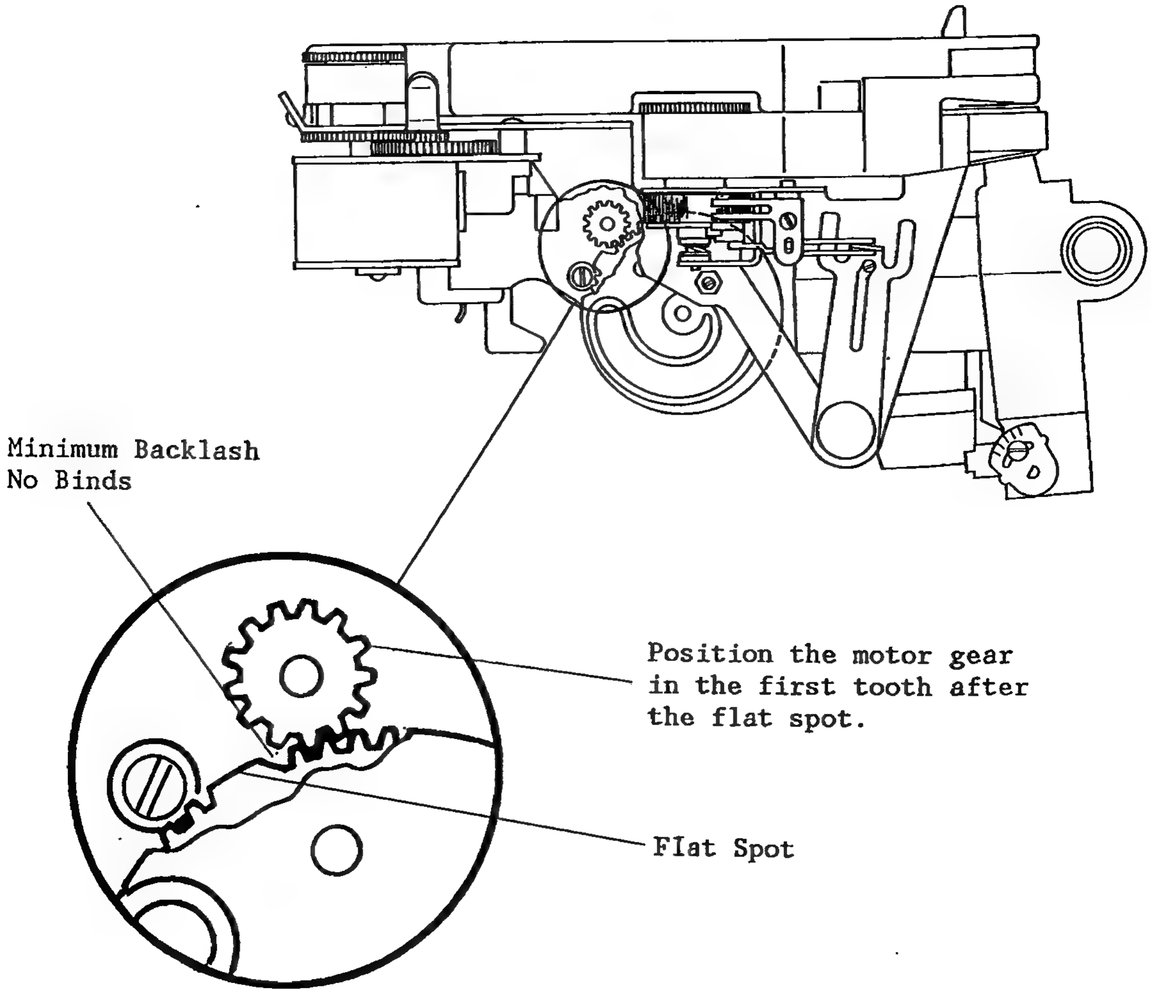
1. **Turn on the machine and leave it turned on** to hold the ribbon lift motor gear locked in position.
2. Disconnect the transport cable (300-6) to prevent the carrier from moving.

   CAUTION

   The ribbon lift cam follower roller (510-9) may fall off when you remove the ribbon plate assembly.

3. Remove the ribbon plate assembly.
4. Install the ribbon lift cam with the motor gear engaging the first tooth after the flat spot on the ribbon lift cam.
5. Check for minimum backlash and no binds between the first tooth of the ribbon lift cam and the ribbon lift motor gear.

   Note: There are 5 detent positions in the ribbon lift motor. Select the detent position that will provide minimum backlash and no binds. The lift cam will have the slightest possible motion and the lift motor gear will not move when correctly adjusted in the proper detent.
6. Install the ribbon plate.
7. Connect the transport cable.
8. Check the ribbon lift adjustment, page 3-4.


Minimum Backlash
No Binds
Position the motor gear in the first tooth after the flat spot.
Flat Spot

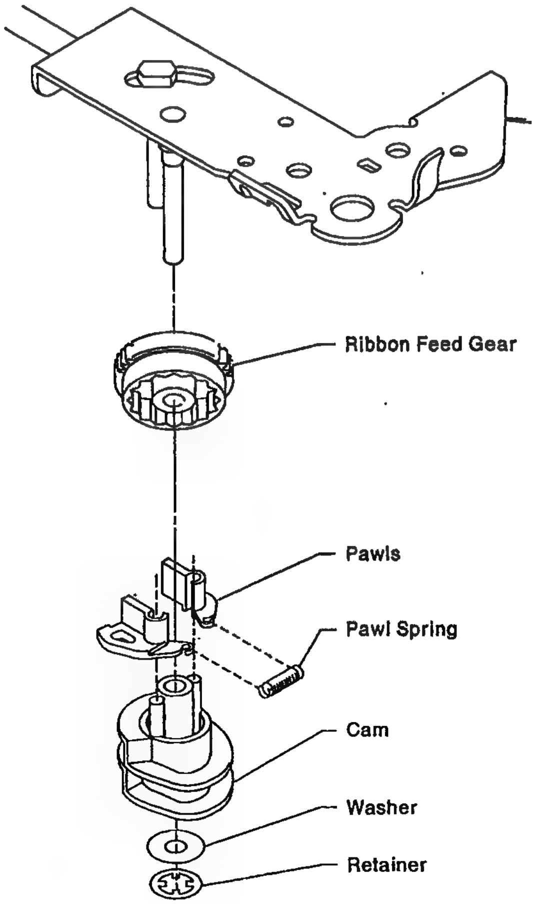
(Right Side View)

RIBBON LIFT CAM REMOVAL, LEVEL 3

1. Remove the carrier.
2. Remove the ribbon plate from the carrier. Be careful not to lose the cam follower roller.
3. Remove the retainer from the bottom of the ribbon lift cam mounting shaft. Do not try to lift the retainer straight off the shaft. Carefully pry the retainer extensions away from the shaft and lift. When you reassemble the lift cam use a new retainer.
4. Hold the ribbon feed gear and lift the entire assembly up. A washer on the top side of the gear may fall out. Place it aside.
5. Turn the assembly over and lift off the gear.
6. Remove the pawls and pawl spring if necessary.

To assemble:

1. Place the pawls on the cam. The black pawl goes on the post near the step in the cam. Connect the spring if necessary.
2. Place the ribbon feed gear on the cam.
3. Hold the assembly and carefully lower it on the mounting shaft. You may have to tap the side of the pawls and cam to move them into place on the shaft.
4. Install the retainer and make the ribbon lift cam end-play adjustment, page 3-6.



RIBBON LIFT MOTOR REMOVAL

1. Remove the ribbon and correcting tape.
2. Note how the ribbon plate load spring (510-15) is installed, then remove it.
3. Note the direction of the high point on the c-clip (510-2), then remove it from the pivot shaft.
4. The cam follower roller (510-9) may fall out when you perform this step so be careful. Slide the ribbon plate to the right until you can lift it off the carrier.
5. Remove the ribbon lift cam (510-8).
6. Disconnect the ribbon lift motor (510-13) connector.
7. Remove the ribbon lift motor mounting screws (510-12).
8. Push the motor to the left to remove it.
9. See the ribbon lift cam installation procedure when you install the ribbon lift cam, page 3-16.

Note: Remember to install the ribbon cam follower roller when you install the ribbon cam. Also position the correcting feed follower on the correcting stud.

RIBBON PLATE REMOVAL

1. Remove the ribbon and correcting tape.
2. Note how the ribbon plate load spring (510-15) is installed, then remove it.
3. Note the direction of the high point on the c-clip (510-2), then remove it from the pivot shaft.
4. The cam follower roller (510-9) may fall out when you perform this step. Slide the ribbon plate to the right until you can lift it off the carrier.
5. Disconnect the ribbon feed motor connector, page 4-1.
6. See the ribbon lift cam installation procedure, page 3-16, if you remove or change the position of the ribbon lift cam (510-8).
7. Check the ribbon lift adjustment, page 3-4.

SELECTION PLATE ASSEMBLY REMOVAL

1. Remove the printwheel, ribbon, and the correcting tape.
2. Disconnect the springs (500-12 and 500-26).
3. Remove the carrier.
4. Disconnect the hammer solenoid and selection motor connectors.
5. Disconnect the homing sensor cable (300-24) from the homing sensor (500-4).

   Note: Mark the position of the eccentrics. Also notice that the eccentric (500-21) for the left side has the longest shoulder. Remember to check the Even Top And Bottom Printing Adjustment, page 3-2, when you install the eccentrics.

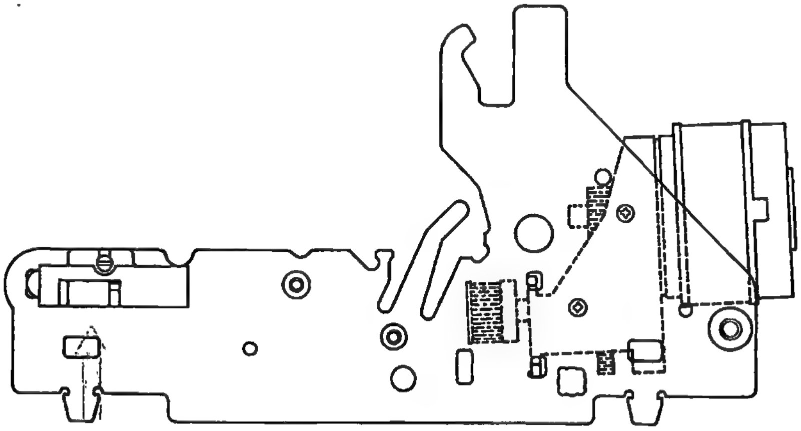
6. Remove the 2 selection plate eccentrics (500-21).
7. Remove the selection plate through the bottom of the carrier.

Note: A replacement selection plate assembly contains a print hammer solenoid with 2 shims. You may remove 1 shim to adjust for gray impression. Put the removed shim back on the solenoid if removing it causes partial lift off. Do not remove shims from other than new replacement selection plate assemblies.

SEMI-AUTOMATIC PAPER INSERTION (SAPI) SWITCH INSTALLATION

Position the SAPI Switch so:

1. It is visually horizontal
2. Its mounting screw is bottomed in the slot. (Push the switch up.)



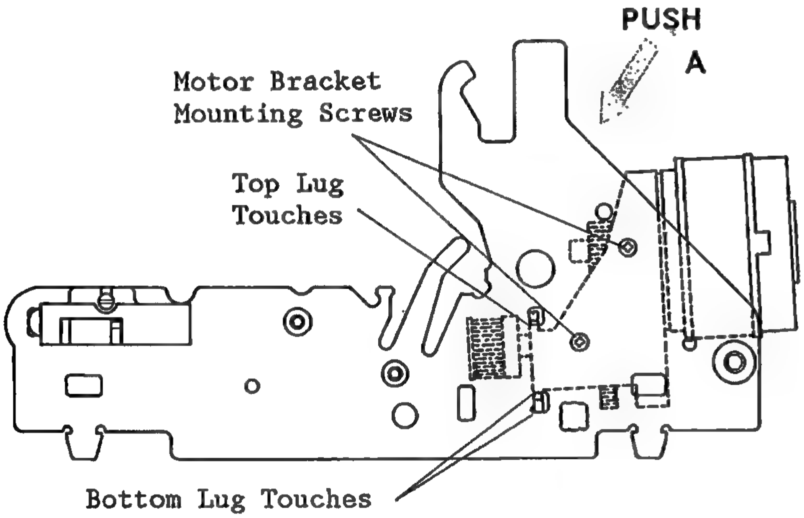
(Right Side View)

TOP COVER REMOVAL

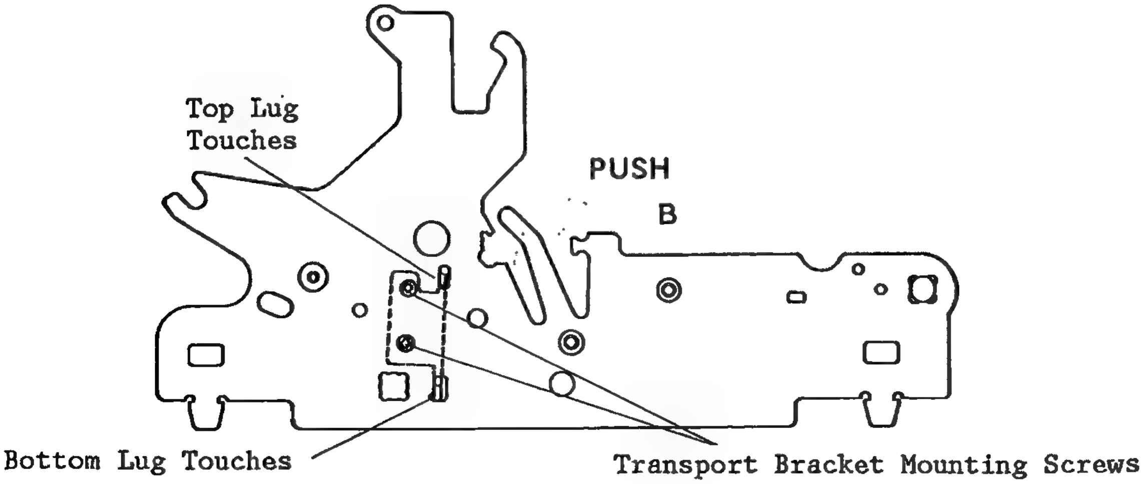
1. Remove the line cord.
2. Disconnect J1P.
3. Pivot the carrier pointer to the left.
4. Push the bottom end of the (4) cover latches in with a tool to release them.
5. Lift the cover up and to the front to remove it.

TRANSPORT BRACKET INSTALLATION

1. Position the right hand end of the transport bracket in the side frame to meet 2 conditions (A):
   a. Down so the bottom lug touches the bottom of the hole in the side frame,
   b. Forward so the top and bottom lugs touch the front of the holes in the side frame.
2. Tighten the 2 motor bracket mounting screws.
3. Position the left end of the transport bracket in the side frame to meet 2 conditions (B):
   a. Down so the bottom lug touches the bottom of the hole in the side frame,
   b. To the rear so the top and bottom lugs touch the rear of the holes in the side frame.
4. Tighten all the transport bracket mounting screws.



(Right Side View)



(Left Side View)

TRANSPORT MOTOR REMOVAL, Level 1, Level 2

1. Remove the top cover.
2. Remove the keyboard cover.
3. Disconnect the transport cable.
4. Roll the transport belt off the drive pulley.
5. Release the frame assembly from the front frame latches (010-12).
6. Hold the front of the frame assembly up so you can reach the transport motor bracket mounting screws (520-7) and remove them.
7. Move the paper release lever to the rear.
8. Remove the 2 right side transport motor bracket mounting screws (520-7).
9. Move the transport motor bracket assembly to the rear, then lift it out of the machine.
10. Remove the 3 transport motor mounting screws (520-3).

    Note: Hold the transport bracket down and to the front when you tighten its mounting screws. (See transport bracket installation, page 3-20. Also install the transport gear load spring (520-4) correctly.

TRANSPORT MOTOR REMOVAL, Level 3

1. Remove the top cover.
2. Disconnect the transport motor cable from the transport motor.
3. Grasp the motor and turn it to release the motor tabs from the bracket.

TRANSPORT ASSEMBLY REMOVAL

1. Remove the:
    - Top Cover
    - Keyboard cover
    - Carrier.
2. Remove the transport belt from the carrier.
3. Perform steps 4 through 8 of the transport motor removal.
4. Remove the 2 idler pulley bracket mounting screws (520-7).
5. Remove the transport belt adjusting screw (520-10).
6. Remove the shipping retainer from the new transport motor bracket.
7. See the transport bracket installation, page 3-20.
8. Check the transport belt adjustment, page 3-8.

HANDLING ESD-SENSITIVE PARTS

Many products use parts that are known to be sensitive to electrostatic discharge (ESD). To prevent damage when you work with ESD-sensitive parts, observe the following instructions; do these in addition to all the usual precautions such as switching off power before removing logic cards.

- Keep the ESD-sensitive part in its original shipping container (a special "ESD bag") until you are ready to install the part into the machine.

- Make the least-possible movements with your body to prevent an increase of static electricity from clothing fibers, carpets, and furniture.

- Put the ESD wrist strap on your wrist. Ensure the machine is turned off. Connect the wrist band to the keyboard ground wire (level 1) or the printer board bracket (level 2, 3). This discharges any static electricity in your body to the machine.

- Hold the ESD-sensitive part by its edge connector shroud (cover); do not touch its pins. If you are removing a pluggable module, use the correct tool.

- Do not place the ESD-sensitive part on the machine cover or on a metal table; if you need to put down the ESD-sensitive part for any reason, first put it into its special bag.

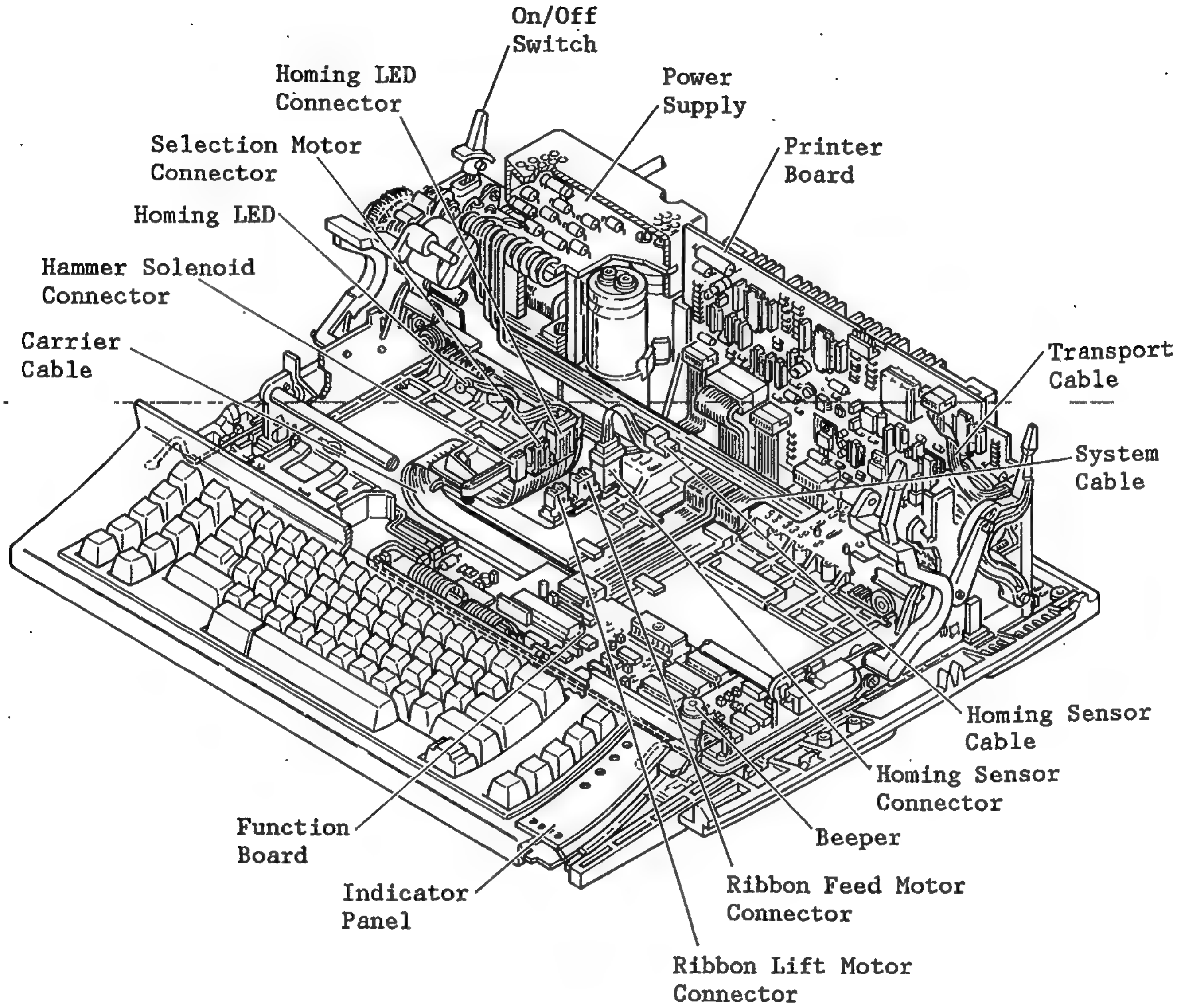
  Machine covers and metal tables are electrical grounds. They increase the risk of damage because they make a discharge path from your body through the ESD-sensitive part. (Large metal objects can be discharge paths without being grounded.)

- Prevent ESD-sensitive parts from being accidentally touched by other personnel such as CSRs or customers. Reinstall machine covers when you are not working on the machine, and do not put unprotected ESD-sensitive parts on a table.

- If possible, keep all ESD-sensitive parts in a grounded metal cabinet (case).

- Be extra careful in working with ESD-sensitive parts when cold-weather heating is used because low humidity increases static electricity.

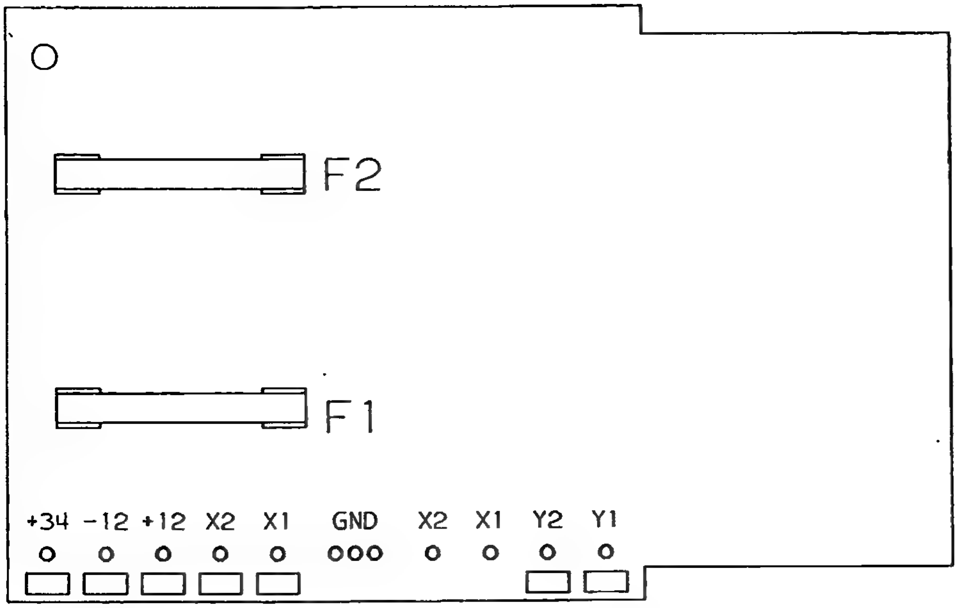
PARTS/TEST POINT LOCATIONS



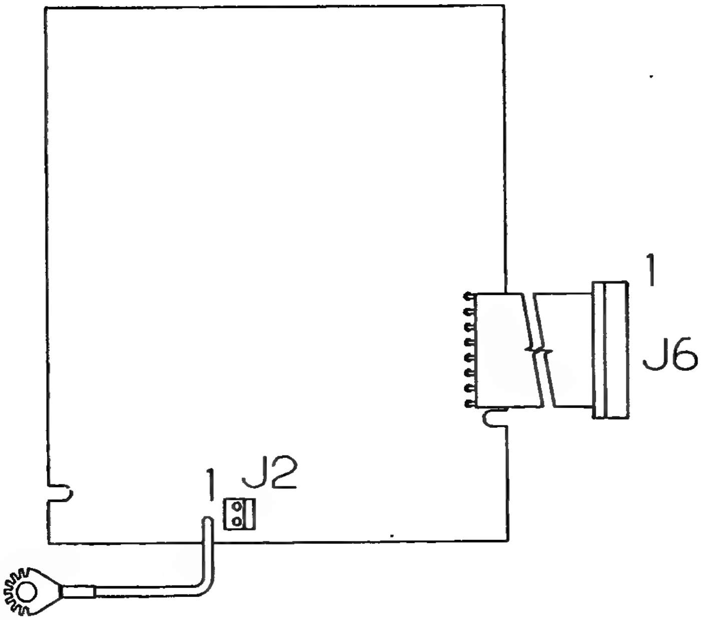
Measuring voltage:

Level 1, use the keyboard ground wire for the common meter lead.
Level 2 and 3 use the Printer board bracket mounting screws or the function board mounting screws for the common meter lead.

Parts/Test Point Location

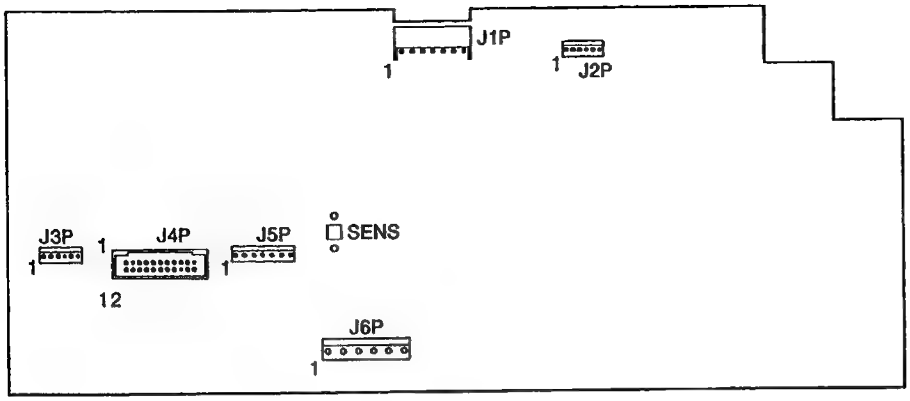


Rectifier Board, WW3, WW5, 6746, and 6747 Level 1
(Top View)

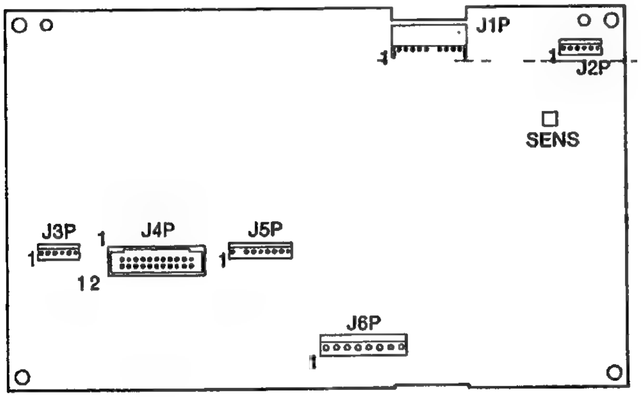


Power Supply Board, WW3, WW5, 6746, and 6747 Level 2-WW6 and 6747-2
(Front View)

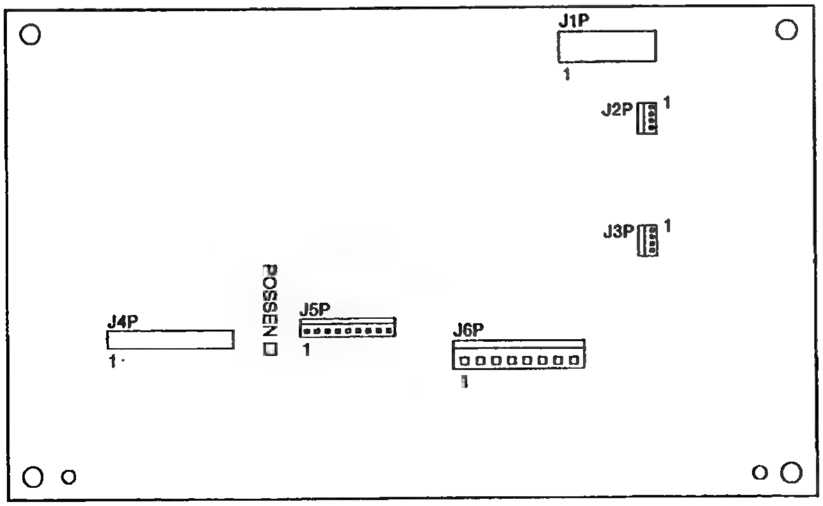
Parts/Test Point Location



Printer Board, WW3, WW5, 6746, and 6747 Level 1
(Rear View)

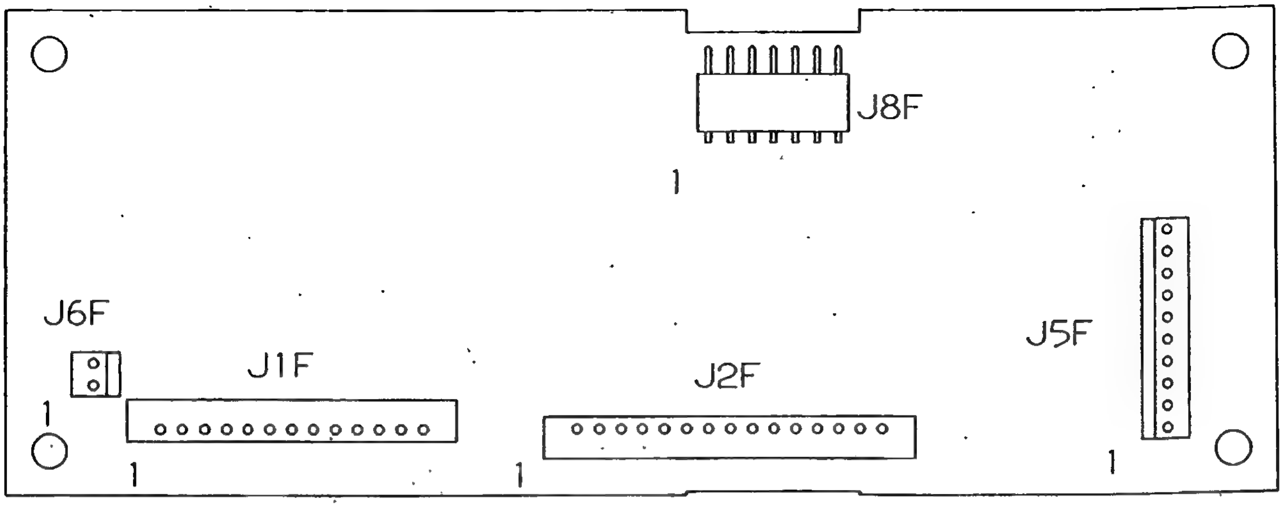


Printer Board, WW3, WW5, 6746, and 6747 Level 2 - WW6 and 6747-2
(Rear View)

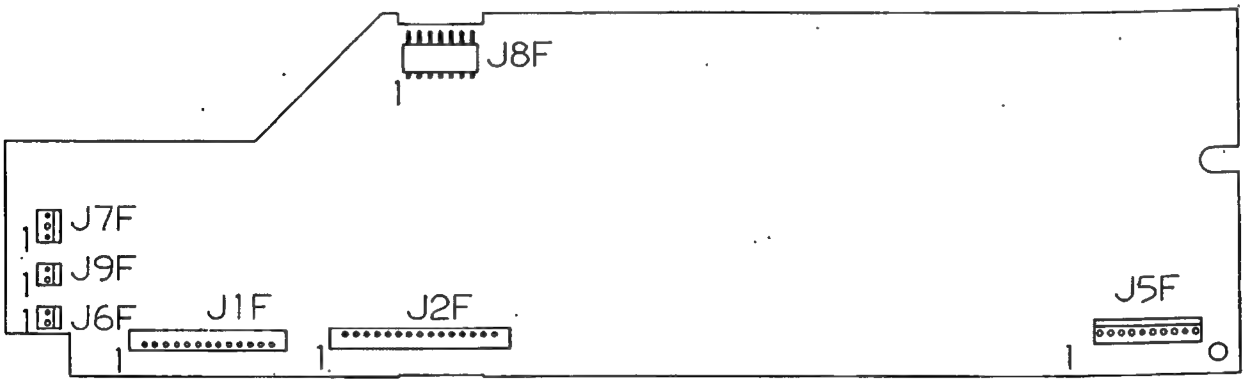


Printer Board, WW3, Level 3
(Front View)

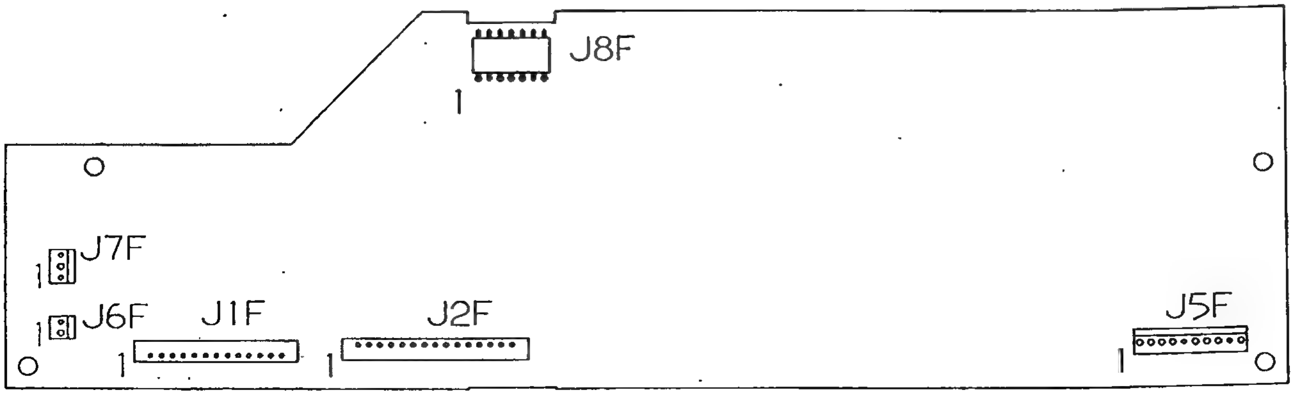
Parts/Test Point Location



Function Board, WW3 and 6746 Level 1 and 2
(Top View)

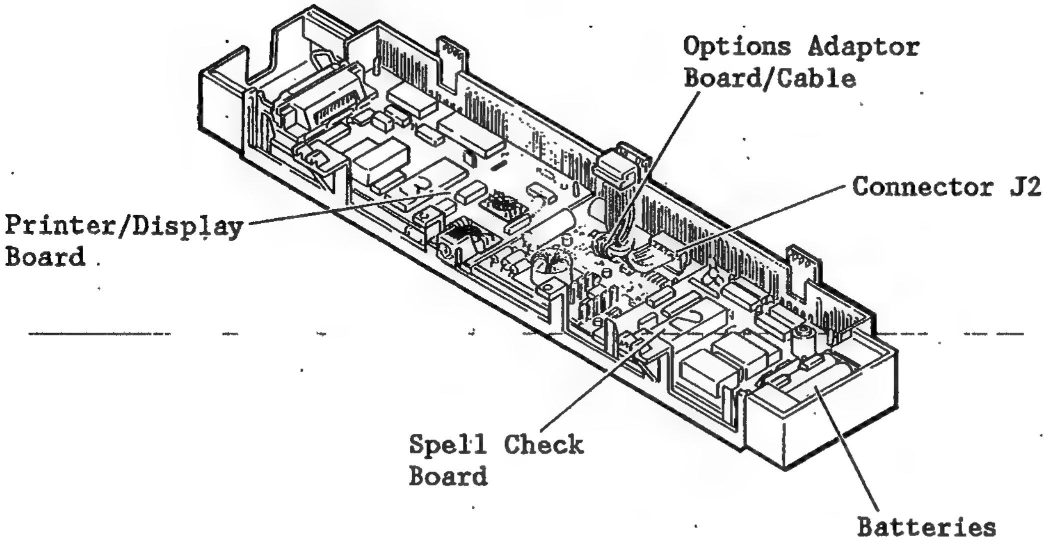


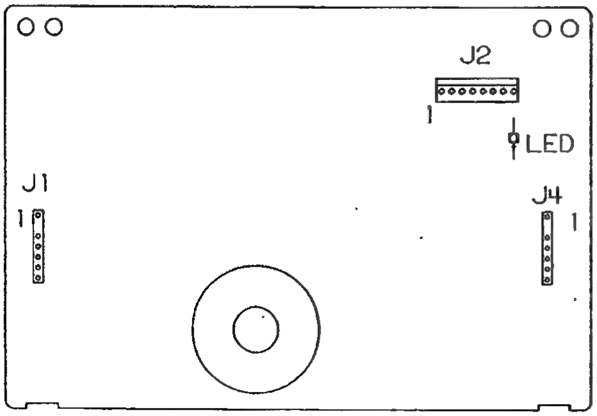
Function Board, WW5 and 6747 Level 1
(Top View)



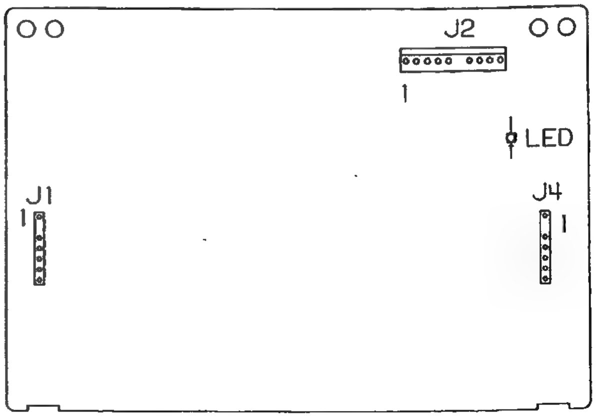
Function Board, WW5 and 6747 Level 2 - WW6 and 6747-2
(Top View)

PARTS/TEST POINT LOCATION – OPTIONS



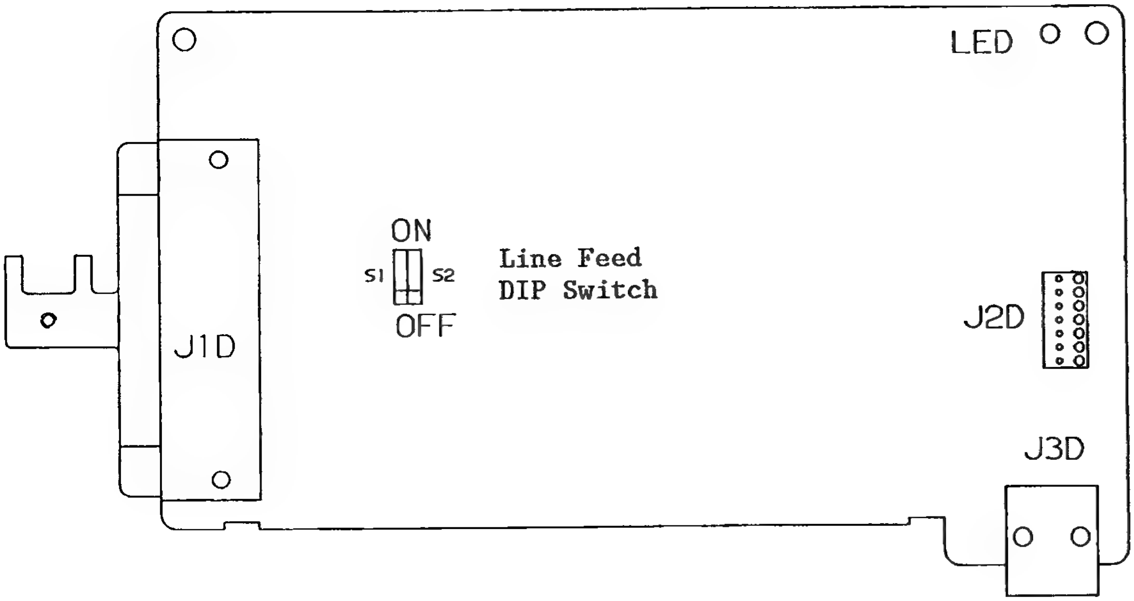


Options Adaptor Board/Cable, Level 1
(Front View)



Options Adaptor Board/Cable, Level 2, 3
(Front View)

Note: Some J2 connectors are marked J3 on the board (level 2).



Printer/Display Board
(Front View)

PREVENTIVE MAINTENANCE

LUBRICATION GUIDE

CAUTION
Cleaning fluids will damage the typewriter covers.

• Carrier rail wipers	No. 10
• Deflector brackets (transport bkt. contact area)	No. 23
• Feed ratchet stud contacting bracket	No. 10
• Homing LED area	Do not lubricate
• Paperfeed motor	
— Gear	No. 23
— Idler plate (contact surface)	No. 23
— Mounting plate (contact surface)	No. 23
— Mounting studs	No. 10
• Paperfeed roller shafts (pivot points)	No. 23
• Paperfeed roller tension spring	
— Where it contacts feed roller bracket	No. 23
— Where it contacts feed roller release shaft	No. 23
• Paperfeed shaft (pivot points)	No. 23
• Paper release bellcrank pin	No. 23
• Paper release cams	No. 23
• Paper release lever cam slot	No. 23
• Print hammer pivot pins	No. 23
• Print hammer (printwheel contact surface)	Do not lubricate
• Print hammer solenoid (rear contact surface)	No. 23
• Ribbon lift cam (teeth, shaft, and cam surface)	No. 23
• Ribbon lift follower roller	No. 23
• Ribbon drive gears and pivots	No. 23
• Ribbon drive gear (where it contacts ribbon plate)	No. 23
• Ribbon plate where it contacts the carrier	No. 23
• Tape feed actuator (pivot)	No. 10
• Tape feed actuator (top)	No. 23
• Tape feed link (both ends)	No. 10
• Tape feed ratchet contacting ribbon plate	No. 23
• Tape feed stud	No. 23
• Transport belt	Do not lubricate
• **Wheelwriter 3, Level 3**	
• Ribbon lift cam pawl studs	No. 23
• Ribbon lift gear (inside teeth)	No. 23
• Upper part of ribbon lift cam mounting shaft	No. 23
• Lower part of ribbon lift cam mounting shaft	No. 10
• Between ribbon lift cam and washer	No. 23
• Ribbon drive gears and mounting studs	No. 23
• Ribbon lift cam track	No. 23
• Ribbon lift cam roller and stud	No. 23

SAFETY INSPECTION GUIDE

General Guidelines

The purpose of this safety inspection guide is to aid you in identifying possible unsafe conditions on machines that are being inspected for a Maintenance Agreement. Each machine has needed items installed to provide the operators and service personnel with an acceptable level of safety. This guide lists only these items. Good judgement should be used to identify possible safety conditions not covered by this safety inspection guide.

If any unsafe conditions are present, you must find out how serious the hazard could be and if you can continue before you correct the hazard.

A copy of current Service Memorandums (SMs), ECAs (Engineering Change Announcements), and Feature/Model changes, along with the machine history, should be reviewed.

Check the following items:

- Damaged, missing, or changed parts, especially in the area of the ON/OFF Switch FRU (600-7) and the Power Supply (600-2).
- Damaged, missing, or changed covers, especially in the area of the Top Cover (010-6) and the Power Supply (600-3) cover.
- Possible safety exposure from any non-IBM attachments.

PARTS CATALOG

How To Use This Parts Catalog

1. SIMILAR ASSEMBLIES: If two assemblies contain a majority of identical parts, they are broken down on the same list. Common parts are shown by one index number. Parts peculiar to one or the other of the assemblies are listed separately and identified by description.

2. **NO PN**: When this indication appears in the part number column, it denotes a group of parts for which no assembly part number has been assigned and the detailed parts should be ordered separately.

3. **NP**: This entry in the unit column indicates the part is non-procurable and the next higher assembly should be ordered.

4. **NR**: This entry in the unit column denotes the part is procurable but not recommended for field replacement. The next higher assembly should be ordered.

5. **AR**: As Required (AR) in the unit column denotes that the quantity is used as required.

6. **(1 to 10)**: This entry in the description column tells you which machines use this part, see foldout page 7-2. For example, (1,2) means the part is used in US WW3 below S/N 0500000, EMEA 6746 below S/N 0500000, and AFE all 6746.

Figure-Index	Part Number	Units	Description
3 -	2512667	1	Cover Asm,Rear-Red (1,2) see page 7-2.
-	2512668	1	Cover Asm,Rear-Yellow
-	2152669	1	Cover Asm,Rear-Blue
-	2512670	1	Cover Asm,Rear-Gray
-	2513754	1	Cover Asm,Rear-White
			For Next Higher Assembly, See Figure 1-2
- 1	5373637	1	• Seal
- 2	5356429	2	• Clip,Retaining
- 3	2513013	3	• Liner
- 4	5373727	1	• Seal
- 5	5356429	3	• Clip,Retaining
- 6	513668	2	• Catch
- 7	81693	4	• Screw,Mach-Bind Hd 6-32 X .375 Long
- 8	1847630	1	• Finger Stock
- 9	1847602	NR	•• Channel, Finger Stock
-10	1847604	NR	•• Finger Stock
-11	5373639	AR	• Seal
-12	No PN	NP	• Cover,Rear-Without Paint

7. A circle around a Figure-Index number indicates a complete assembly. The assembly is broken down within the figure.

8. **INDENTURE**: The indenture is marked by a series of dots located before the part description. The indenture indicates the relationship af a part to next higher assemblies. For example:

Indenture	Relationship of Parts
(No Dot)	MAIN ASSEMBLY
(One Dot)	• Detail parts of a main assembly
(One Dot)	• Subassembly of the main assembly
(Two Dot)	•• Detail part of a one dot subassembly
(Two Dot)	•• Subassembly of a one dot subassembly
(Three Dot)	••• Detail part of a two dot subassembly

Machine/Level Matrix

Country	Model	Code
U.S.	WW3 below S/N 0500000	1
U.S.	WW3 above S/N 0500000	3
U.S.	WW3 above S/N 3000000	11
U.S.	WW5 below S/N 0500000	5
U.S.	WW5 above S/N 0500000	7
U.S.	WW6	9
EMEA	6746 below S/N 0500000	2
EMEA	6746 above S/N 0500000	4
EMEA	6747	6
EMEA	6747-2	10
AFE	6746	2
AFE	6747	6
AFE	6747 above S/N 0085165	8
AFE	6747-2	10

Note: Parts with no code in the description column can be used on all machines.

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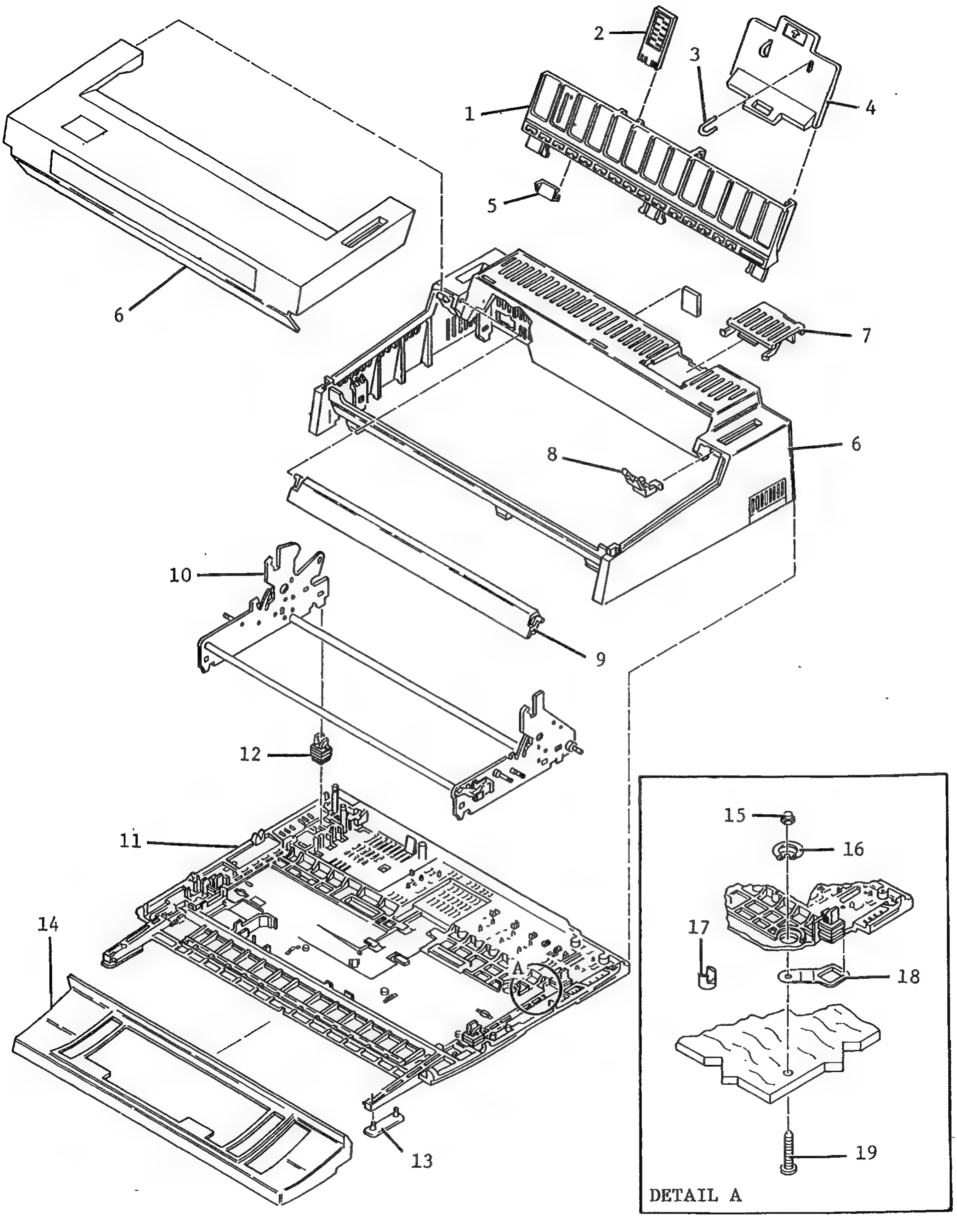


Figure 1. Cover/Frame Asm-Mech 010 (1 of 2)

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
1-1	1246759	1	Support Asm.
-2	1337671	1	• Indicator,EOP
-3	1337668	AR	• Clip,Instruction Card
-4	No PN	NP	• Plate,Instruction Card
-5	1337672	1	• Guide,Page Edge
-6	1337746	1	Cover,Top and Center Also order index -24, 25,and -28
-6A	1340768	AR	• Foam, Top Cover, Lever Insulation (Not Shown In Figure)
-7	1342140	1	• Door,Options Access
-8	1337667	2	• Hinge,Cover (Replace both)
-9	1342178	1	• Table,Erase
-9A	1356862	1	• Paper Table
-10	1384251	1	Frame Asm Also order PN 1384921 and 1342485
-10	1384807	1	Frame Asm, (11) see page 7-2 Also order PN 1384921
-11	1337006	1	Cover,Bottom, (1,2,5,6) see page 7-2. Includes index 12 and 13. Also Order Index -26 and -27
-11	1356737	1	Cover,Bottom, (3,4,7,8,9,10,11) see page 7-2. Includes index 12. Includes Keyboard Adjusting Bail and Keyboard Mounting Clip Also Order Index -26 and -27 Also order Parts Packet 1384286 and PN 1356741 (order 2)
-12	1337587	4	Latch,Frame (Replace All 4)
-13	1337611	2	Pad,Foot
-14	1317960	1	Cover, Keyboard (1,2,3,4,11) see page 7-2.
-14	1317961	1	Cover,Keyboard (5,6,7,8,9,10) see page 7-2.
-15	0117281	AR	Nut
-16	1342358	AR	Collar
-17	1342428	1	Guide,Hole Aligning
-18	1342359	1	Plate,Right
-18	1342372	1	Plate,Left
-19	1287007	AR	Bolt,5/8"
-19	1287008	AR	Bolt,3/4"
-19	1287009	AR	Bolt,1"
-19	1287010	AR	Bolt,1 1/4"
-19	1287011	AR	Bolt,1 1/2"
-19	1287012	AR	Bolt,1 3/4"
-19	1287013	AR	Bolt,2"
-19	1287911	AR	Bolt,2 1/4"
-19	1287912	AR	Bolt,2 1/2"
-19	1287913	AR	Bolt,2 3/4"
-19	1287914	AR	Bolt,3"

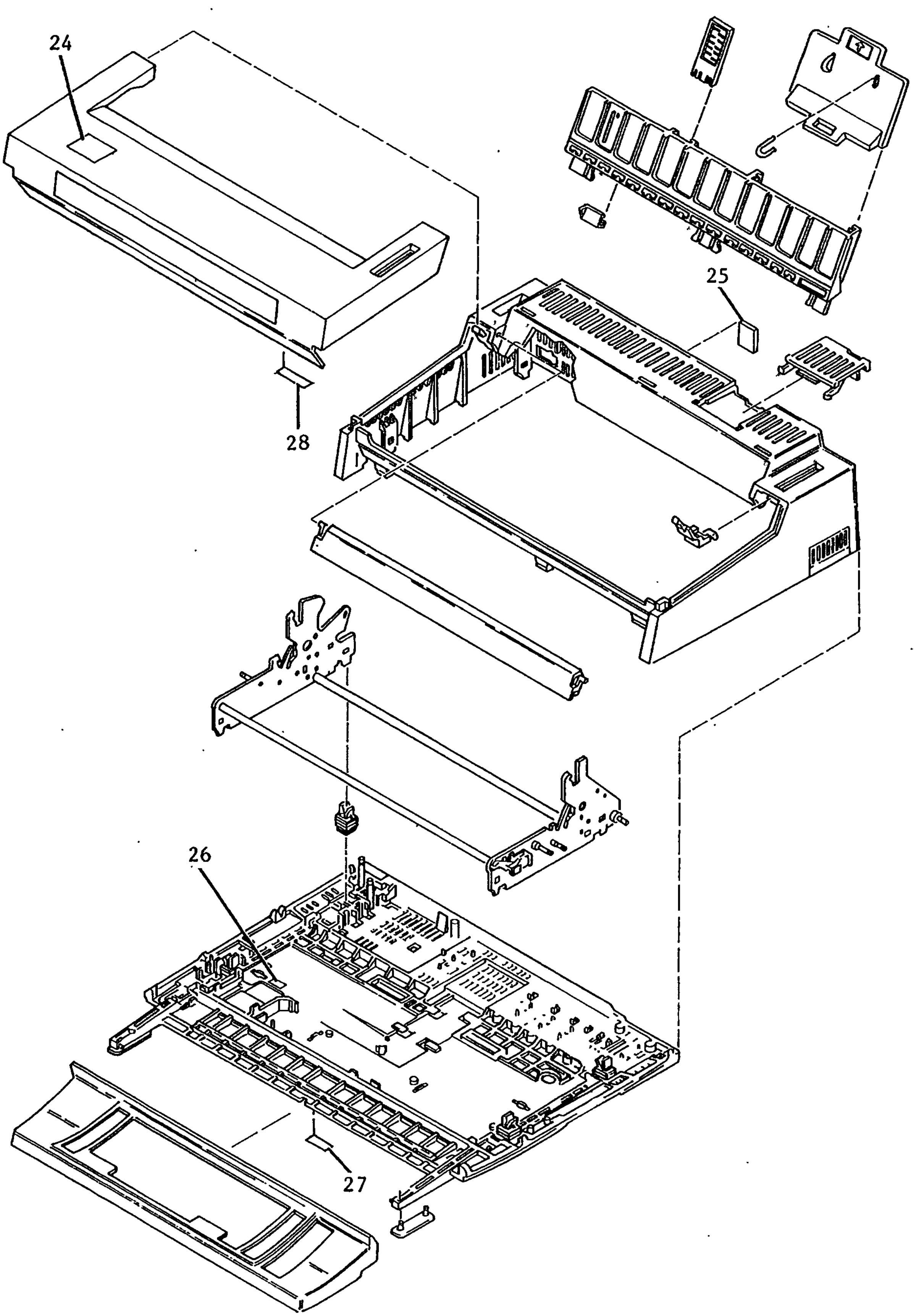
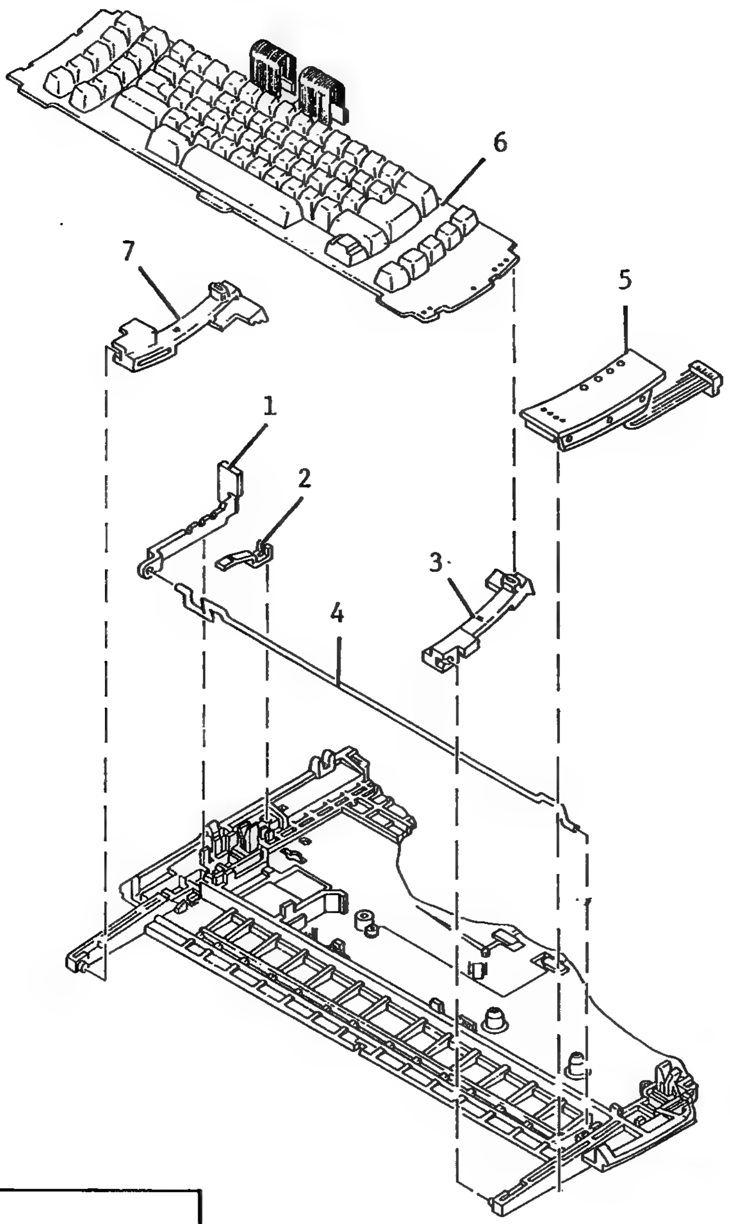


Figure 1. Cover Asm - Mech 010 (2 of 2)

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
1-24	1317718	1	Logo,Top, (5,7) see page 7-2.
-24	1317720	1	Logo,Top, (1,3,11) see page 7-2.
-24	1317787	1	Logo,Top, (2,4) see page 7-2.
-24	1342097	1	Logo,Top, (6,8) see page 7-2.
-24	1050091	1	Logo,Top, (9) see page 7-2.
-24	1050094	1	Logo,Top, (10) see page 7-2.
-25	1342151	1	Logo,Rear(Made in U.S.A.)
-25	1317789	1	Logo,Rear(Made in U.S.A.) AFE
-25	1317791	1	Logo,Rear(Made in Netherlands)
-25	1317793	1	Logo,Rear(Made in Mexico)
-25	1342067	1	Logo,Rear(Made in U.S.A.)EMEA
-26	1384017	1	Label,Serial Number
-27	1342065	1	Label,Elect. Req., (1,3,5,7,11) see page 7-2.
-27	1050385	1	Label,Elect. Req., (9) see page 7-2.
			For Specific WT Country Info see Chart A, page 7-39 (2,4,6,8,10) see page 7-2.
-27	1317700	1	Label,Bilingual,Canadian/English
-27	1317706	1	Label,240 Volts 50 Hz(Made in Amsterdam)
-27	1317716	1	Label,220 Volts 50 Hz(Made in Amsterdam)
-27	1317726	1	Label,110/115 Volts 50/60 Hz (Made in Mexico)
-27	1317730	1	Label,Australia 240 Volt 50 Hz
-27	1317734	1	Label,Mexico 127 Volt 60 Hz
-27	1317742	1	Label,220 Volts 50/60 Hz(Made in Mexico)
-27	1317965	1	Label,Write in Voltage and Frequency (Made in U.S.A.)
-27	1317969	1	Label,Write in Voltage and Frequency (Made in Amsterdam)
-27	1317970	1	Label,Write in Voltage and Frequency (Made in Mexico)
-27	1342064	1	Label,220 Volts 50/60 Hz (Made in U.S.A.) (European Test House)
-27	1342330	1	Label,240 Volts 50/60 Hz (Made in U.S.A.) (British Test House)
-28	1317712	1	Label,Feature Installation, (1,2,5,6) see page 7-2.
-28	1356837	1	Label,Feature Installation, (3,4,7,8,9,10,11) see page 7-2.



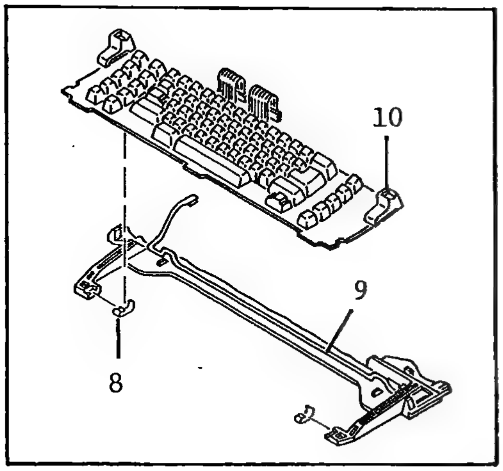


Figure 2. Keyboard Asm-Mech 040

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
2-1	1339790	1	Lever,Keyboard Height[1]
-2	No PN	1	Spring,Keyboard Height[1] Part of Parts Packet 1384497
-3	1339211	1	Bracket,Keyboard Mounting Right[1]
-4	1339167	1	Bail,Keyboard Height[1]
-5	1337856	1	Panel-LED Housing Asm, (5,7,9) see page 7-2.
-5	1337897	1	Panel-LED Housing Asm, (1,3,11) see page 7-2. For Specific WT Country Information See Chart A on page 7-39 (2,4,6,8,10) see page 7-2.
-6	1384031	1	Keyboard, (1,3,11) see page 7-2.
-6	1384121	1	Keyboard, (5,7) see page 7-2. For Specific WT Country Information See Chart A on page 7-39 (2,4,6,8,10) see page 7-2.
-6	1384647	1	Keyboard, (9) see page 7-2. For Specific WT Country Information See Chart A on page 7-39 (2,4,6,8,10) see page 7-2.
-7	1339212	1	Bracket,Keyboard Mounting[1] Left
-8	No PN	2	Clip,Keyboard Mounting[1] Part of Parts Packet 1384286
-9	1356738	1	Bail,Keyboard Height[1]
-10	1356741	2	Bracket,Keyboard Mounting, Right and Left[1]

[1] See illustration for correct level

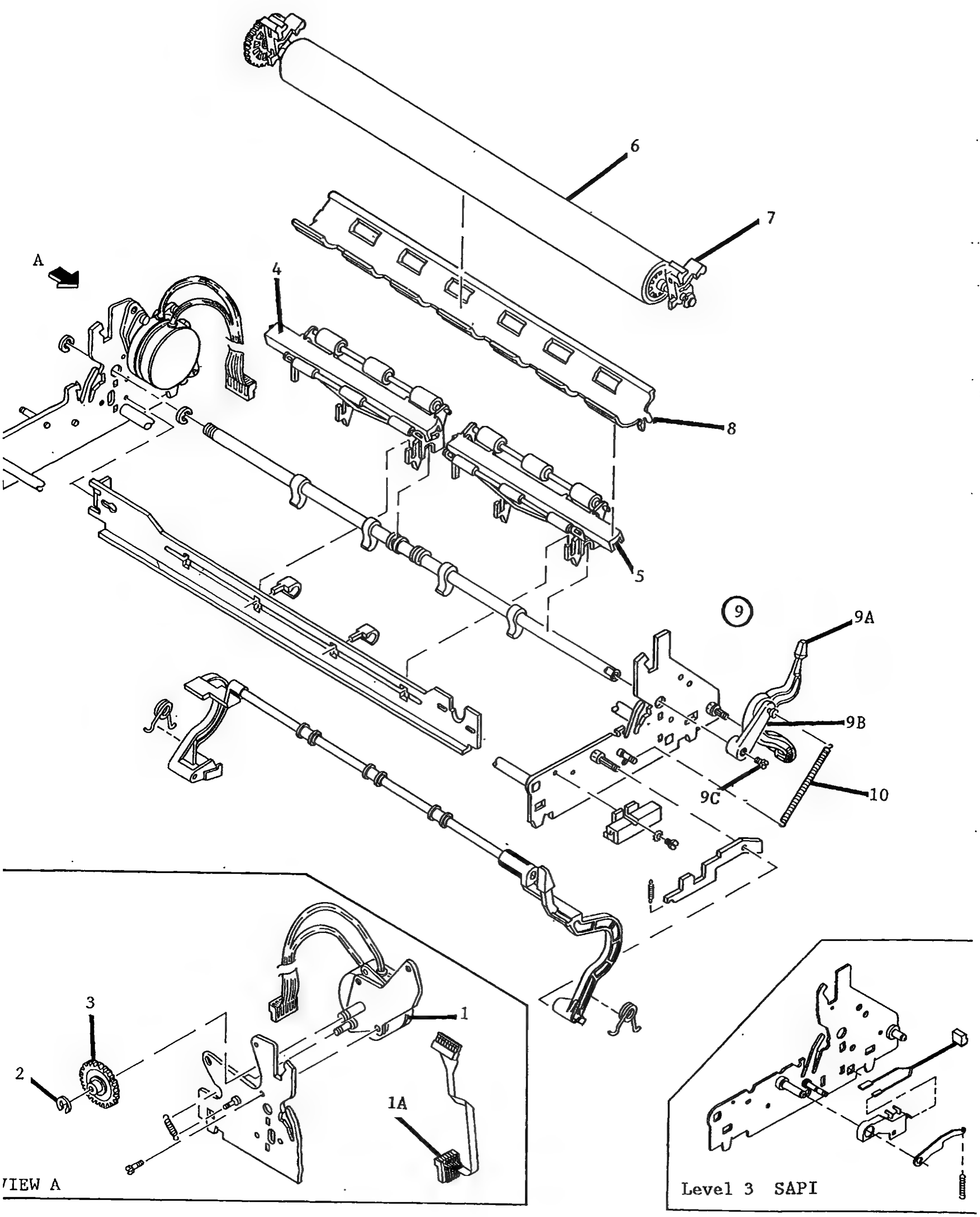


Figure 3. Paperfeed Asm - Mech 230 (1 of 2)

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
3-1	1384043	1	Motor Asm,Paperfeed Includes Index -2 And 1337033
-1	1384560	1	Motor,Paperfeed- 5.33 Linespacing Includes 1362069
-1	1384829	1	Motor,Paperfeed (11) see page 7-2 Also order 1337033
-1A	1341678	1	Cable,Paperfeed Motor (11) see page 7-2
-2	No PN	1	Retainer Part of Parts Packet 1384286
-3	1337033	1	Gear,Intermediate Also Order Index -6
-3	1356655	1	Gear,Intermediate Metric Linespacing
-3	1362069	1	Gear,Intermediate- 5.33 Linespacing
-4	1384145	1	Roller Asm,Paperfeed LH Also Order Index -5
-4A	1432605	1	•Feed Roller,Front
-4B	1432606	1	•Feed Roller,Rear
-4C	1337194	1	•Spring,Feed Roller Bias
-4D	1339034	1	•Feed Roller Asm Support,LH
-4E	1337037	2	•Support,Feed Roller
-5	1384146	1	Roller Asm,Paperfeed RH Also Order Index -4
-5A	1432605	1	•Feed Roller,Front
-5B	1432606	1	•Feed Roller,Rear
-5C	1337194	1	•Spring,Feed Roller Bias
-5D	1339033	1	•Feed Roller Asm Support,RH
-5E	1337037	2	•Support,Feed Roller
-6	1384049	1	Platen, also Order Index -3
-7	1339074	1	•Latch,Platen, RH
-8	1342482	1	Deflector
-9	1384047	1	Lever,Paper Release Asm., includes Index -10, -15 And Mounting Screw
-9A	1337055	1	•Lever,Paper Release
-9B	1339057	1	•Bellcrank,Paper Release
-9C	No PN	1	•Screw, Part of Parts Packet 1384498
-10	No PN	1	•Spring Part of Parts Packet 1384497

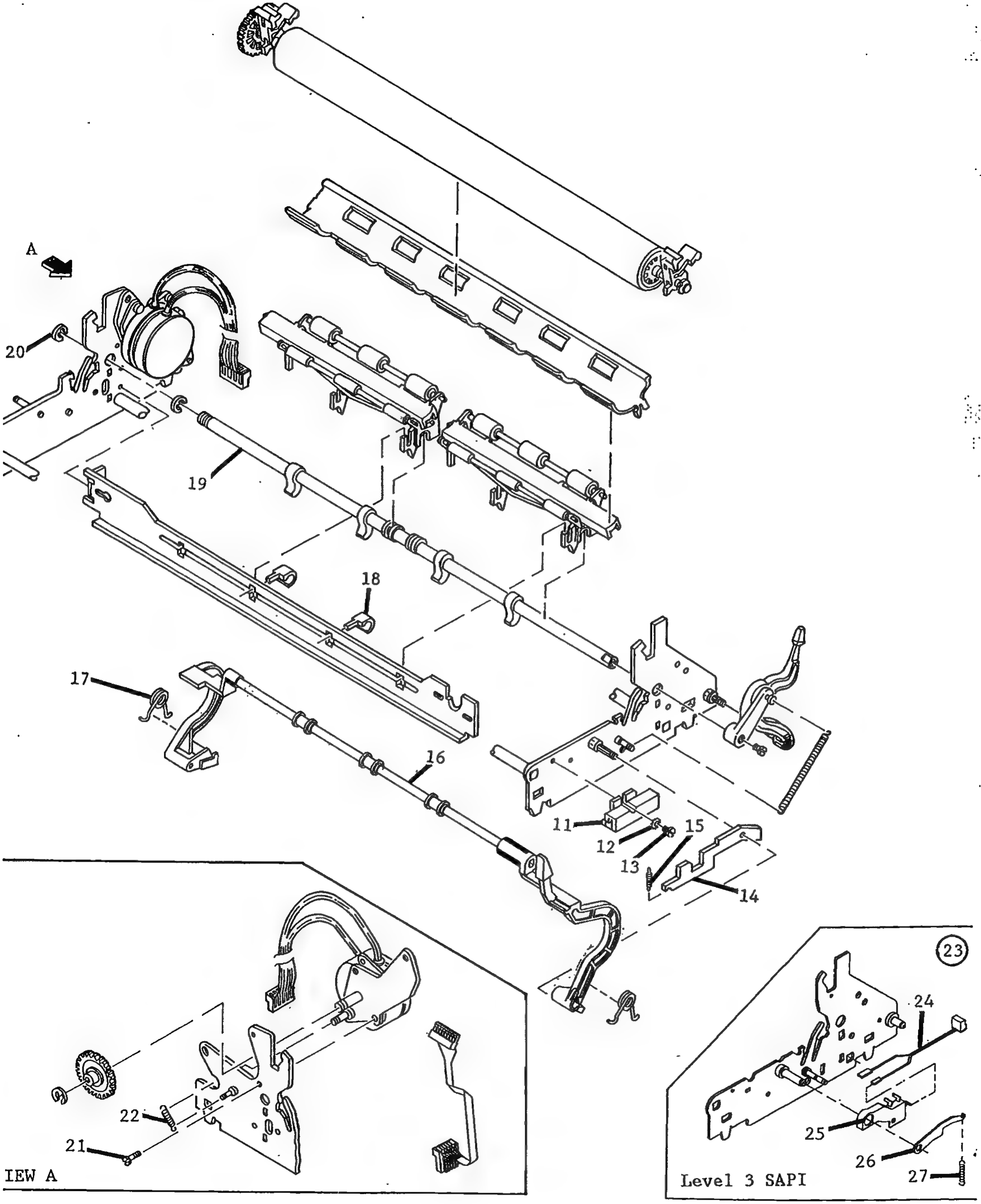


Figure 3. Paperfeed Asm - Mech 230 (2 of 2)

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
3-11	1317502	1	Switch,Semi-Automatic Paper Insertion (SAPI)
-12	No PN	1	Washer, part of Parts Packet 1384499
-13	1362841	1	Screw
-14	1337061	1	Lever,Semi-Automatic Paper Insertion (SAPI)
-15	No PN	1	•Spring, part of Parts Packet 1384497
-16	1384921	1	Paper Bail Asm
-16	1337201	1	•Shaft,Paper Bail
-16	1440671	3	•Paper Bail Roller
-16	1430498	1	•Paper Bail Arm, right
-16	1362388	1	•Paper Bail Arm, left
-17	No PN	AR	• Spring, part of Parts Packet 1384497
-18	1317976	1	Clip,Paperfeed Roller Asm Retainer
-19	1337884	1	Shaft,Paperfeed Cam, also Order Index -9
-20	No PN	AR	Retainer, part of Parts Packet 1384499
-21	No PN	AR	Screw, part of Parts Packet 1384498
-22	No PN	1	Spring, part of Parts Packet 1384497
-23	1384989	1	Switch Asm,SAPI (11) see page 7-2
-24	1341681	1	•Cable,SAPI (11) see page 7-2
-25	1430489	1	•Switch,SAPI (11) see page 7-2
-26	1430492	1	•Lever,Override (11) see page 7-2
-27	No PN	1	•Spring,Override Part of Parts Packet 1384861

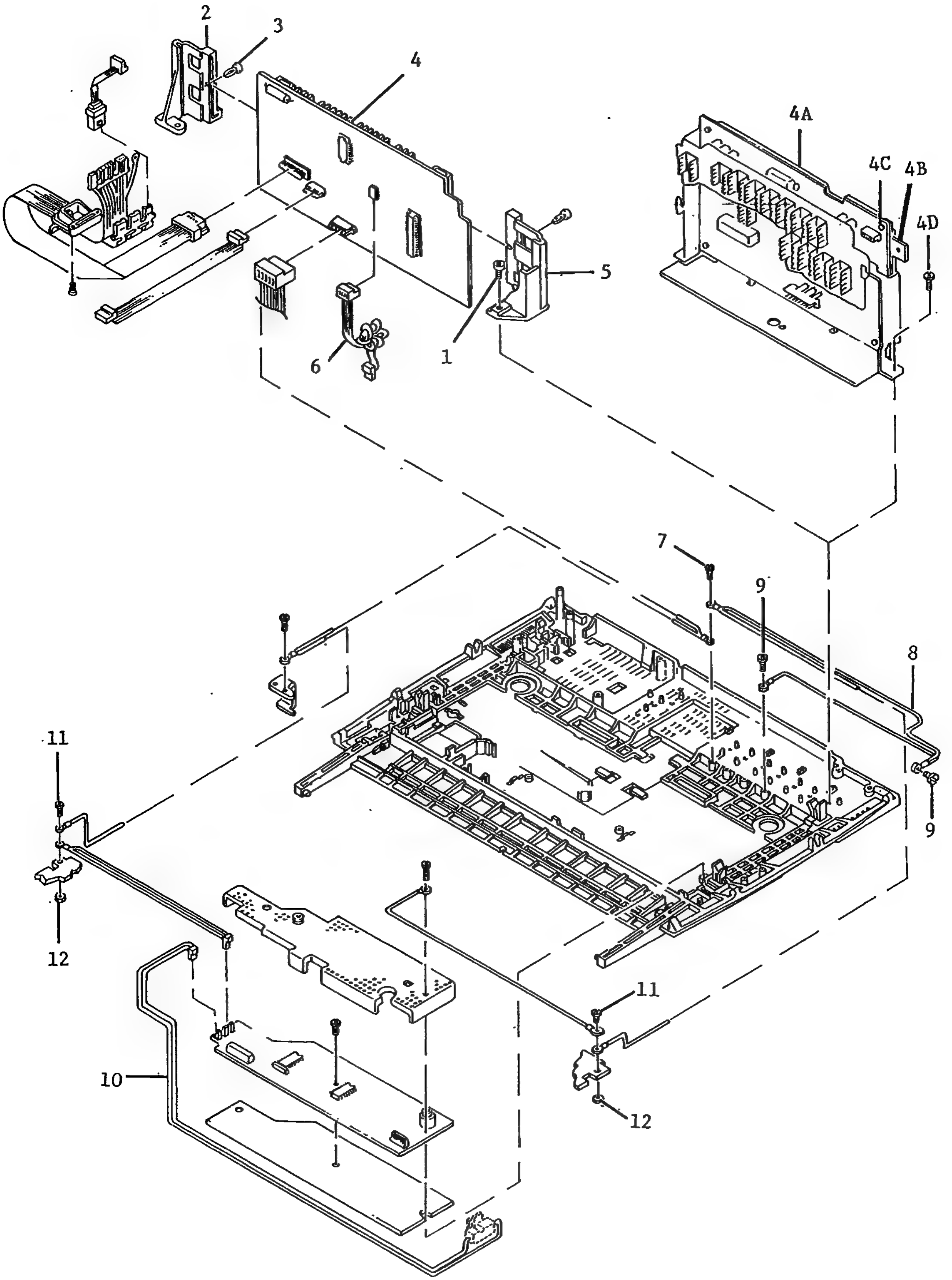


Figure 4. Electronics-Mech 300 (1 of 2)

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
4-1	No PN	AR	Screw, (1,2,5,6) see page 7-2. Part of Parts Packet 1384498
-2	1337866	1	Bracket,Heatsink/Board Left (1,2,5,6) see page 7-2.
-3	No PN	AR	Retainer, (1,2,5,6) see page 7-2. Part of Parts Packet 1384499
-4	1384051	1	Board,Printer Asm, (1,2) see page 7-2.
-4	1384131	1	Board,Printer Asm, (5,6) see page 7-2.
-4A	1384283	1	Board,Printer Asm, (3,4) see page 7-2.
-4A	1384296	1	Board,Printer Asm, (7,8,9,10) see page 7-2.
-4A	1384991	1	Board,Printer (11) see page 7-2
-4B	1341677	1	Bracket, Mounting (11) see page 7-2
-4C	No PN	4	Screw, (7,8,9,10) see page 7-2. Part of Parts Packet 1384286
-4D	No PN	2	Screw, (3,7,8,9,10,11) see page 7-2. With Aluminum Bottom Cover - Part of Parts Packet 1384286 With Plastic Bottom Cover -(3,7,8,9,11) see page 7-2. Part of Parts Packet 1384286
-5	1337867	1	Bracket,Heatsink/Board Right (1,2,5,6) see page 7-2.
-6	1317722	1	Cable,Transport Motor
-7	No PN	AR	Screws, (1,2,5,6) see page 7-2. Part of Parts Packet 1384498
-8	1342488	1	Common Wire,Keyboard
-9	No PN	AR	Screw, (1,2,5,6) see page 7-2. Part of Parts Packet 1384498
-10	1339037	AR	Cable,Semi-Automatic Paper Insertion (SAPI)
-11	No PN	AR	Screw, (1,2,5,6) see page 7-2. Part of Parts Packet 1384498
-12	No PN	AR	Nut, (1,2,5,6) see page 7-2. Part of Parts Packet 1384499

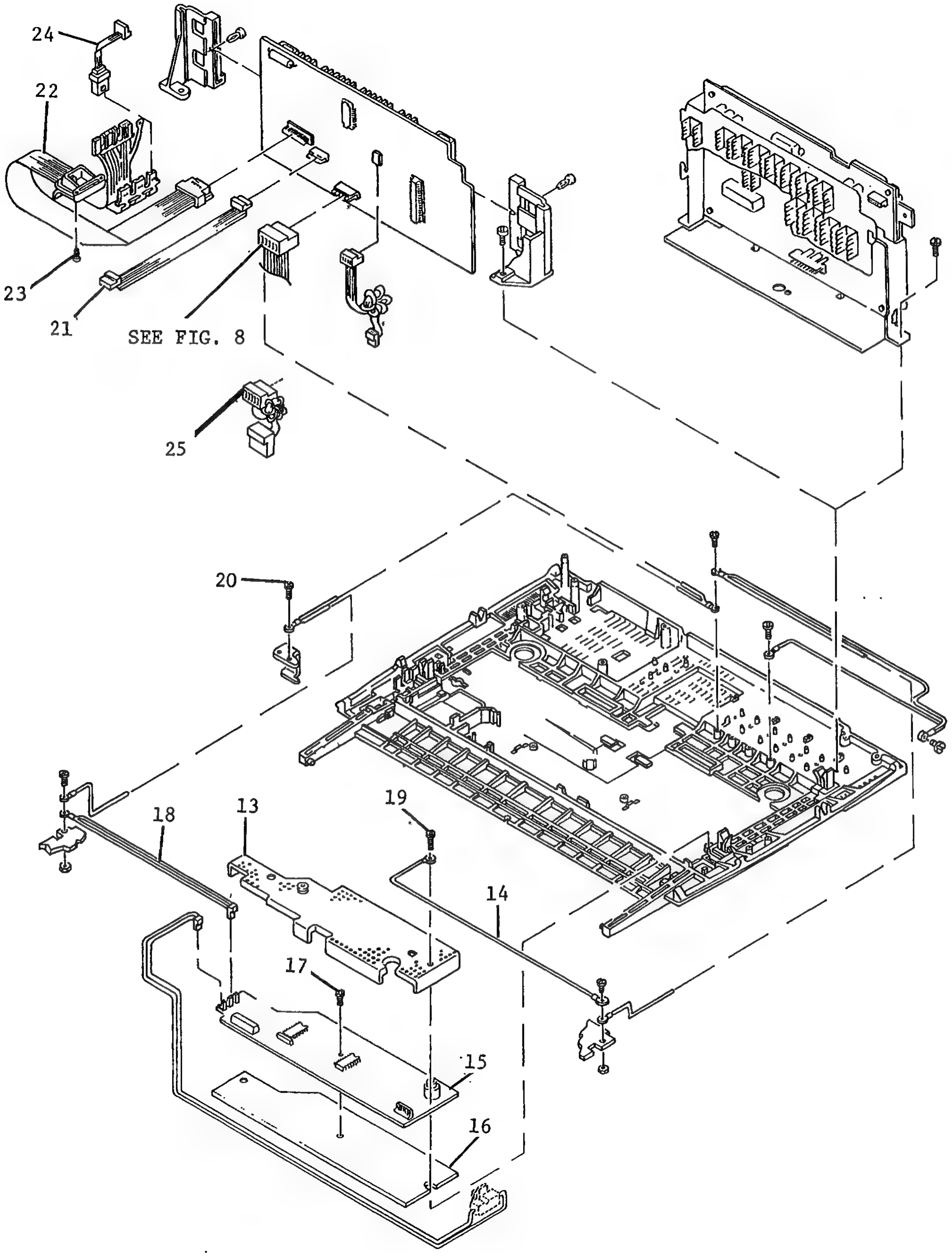


Figure 4. Electronics-Mech 300 (2 of 2)

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
4-13	1337595	1	Cover,Function Bd (1) see page 7-2.
-13	1356739	1	Cover,Function (3,11) see page 7-2.
-13	1356742	1	Cover,Function Bd (2,4) see page 7-2.
-13	1337717	1	Cover,Function Bd (5,6) see page 7-2.
-13	1356937	1	Cover,Function Bd (7,8,9,10) see page 7-2.
-14	1342173	1	Common Wire, Right Keyboard/Function Board Cover (1,2,5,6) see page 7-2.
-15	1384052	1	Board,Function (1) see page 7-2.
-15	1384282	1	Board,Function (3,11) see page 7-2.
-15	1384302	1	Board,Function (2) see page 7-2.
-15	1384287	1	Board,Function (4) see page 7-2.
-15	1384295	1	Board,Function (7,8,) see page 7-2.
-15	1384378	1	Board,Function (5,6) see page 7-2.
-15	1384646	1	Board,Function (9,10) see page 7-2.
-16	No PN	NP	• Shield Function Bd
-17	No PN	AR	Screws, (1,2,5,6,) see page 7-2. Part of Parts Packet 1384498
-17	No PN	2	Screws, (3,4,7,8,9,10,11) see page 7-2. With Plastic Bottom Cover - Part of Parts Packet 1384286 With Aluminum Bottom Cover - Part of Parts Packet 1384286
-18	1342493	1	Common,Wire Left Keyboard/Function Board, (1,2,5,6) see page 7-2.
-19	No PN	AR	Screw, (1,2,5,6) see page 7-2. Part of Parts Packet 1384498
-20	1621170	AR	Screw, (1,2,5,6) see page 7-2. Part of Parts Packet 1384498
-21	1337571	1	Cable,System (5,6) see page 7-2.
-21	1246684	1	Cable,System (7,8,9,10) see page 7-2.
-21	1246662	1	Cable,System (1,2,3,4,11) see page 7-2.
-22	1384069	1	Cable,Carrier (Includes Clamp)
-23	No PN	AR	Screw Part of Parts Packet 1384498
-24	1342160	1	Cable,Homing Sensor
-25	1384103	1	Cable,Power Supply Jumper, RFI (2,5) see page 7-2.

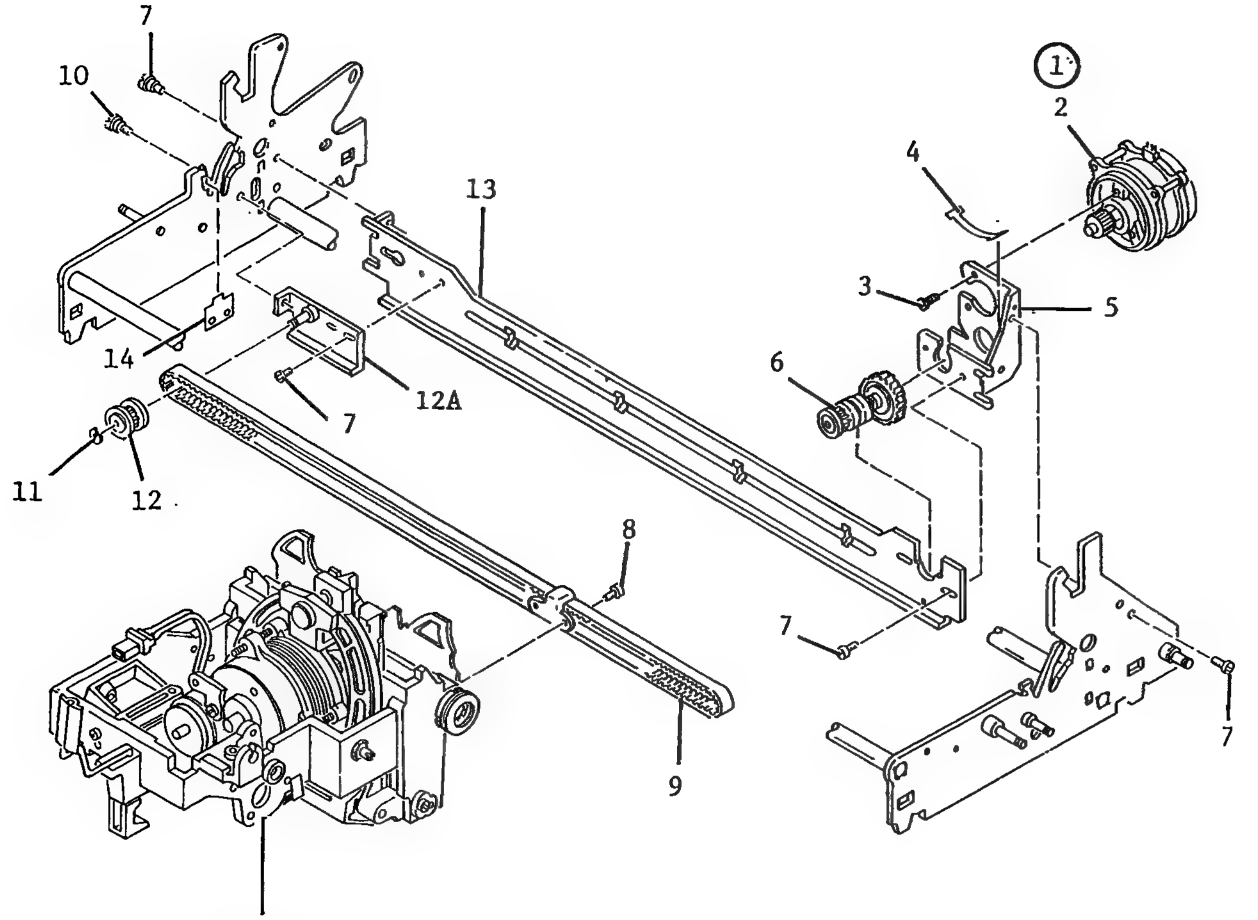


Figure 5. Transport Asm-Mech 520

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
5-1	1384082	1	Transport Asm
-2	1384081	1	• Motor,Transport
-3	No PN	AR	• Screw Part of Parts Packet 1384498
-4	No PN	NP	• Spring,Transport Gear Load
-5	No PN	NP	• Bracket,Transport Motor
-6	No PN	NP	• Gear,Transport
-7	No PN	AR	• Screw Part of Parts Packet 1384498
-8	No PN	AR	• Screw Part of Parts Packet 1384498
-9	1337651	1	• Belt,Transport
-10	No PN	1	• Screw Part of Parts Packet 1384286
-11	No PN	1	• Retainer Part of Parts Packet 1384499
-12	1339146	1	• Transport Pulley
-12A	1339152	1	• Bracket, LH Pulley
-13	1339140	1	Bracket,Transport Mounting
-14	1342485	1	Clip,Homing Sensor Flag Stop

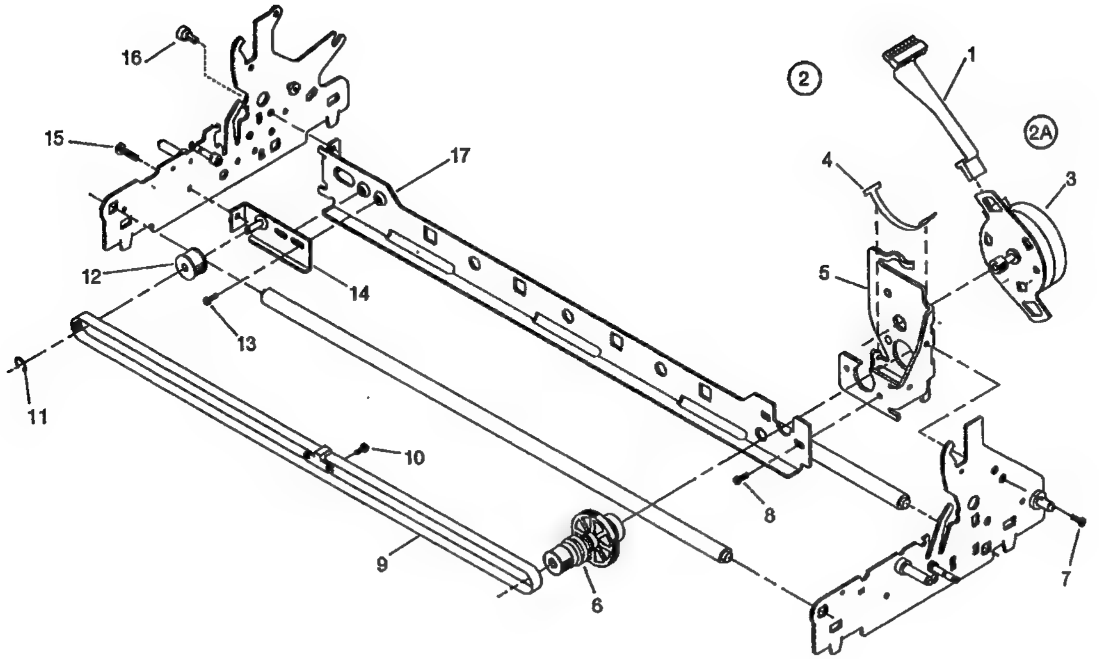


Figure 6. Transport Asm - (2 of 2) Wheelwriter 3, Level 3

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
6-1	1341679	1	Cable,Transport Motor
-2	1384822	1	Transport Asm
-2A	1384832	1	•Transport Motor Asm
-3	1384823	1	•• Motor,Transport
-4	1430495	1	•• Spring,Transport Gear Load
-5	1430481	1	•• Bracket,Transport Motor
-6	1384824	1	•• Gear,Transport
-7	No PN	AR	• Screw Part of Parts Packet 1384498
-8	No PN	AR	• Screw Part of Parts Packet 1384498
-9	1337651	1	• Belt,Transport
-10	No PN	1	• Screw Part of Parts Packet 1384286
-11	No PN	1	• Retainer Part of Parts Packet 1384499
-12	1339146	1	• Transport Pulley
-13	No PN	AR	• Screw Part of Parts Packet 1384498
-14	1339152	1	• Bracket, LH Pulley
-15	No PN	1	• Screw Part of Parts Packet 1384286
-16	No PN	AR	• Screw Part of Parts Packet 1384498
-17	1339140	1	Bracket,Transport Mounting

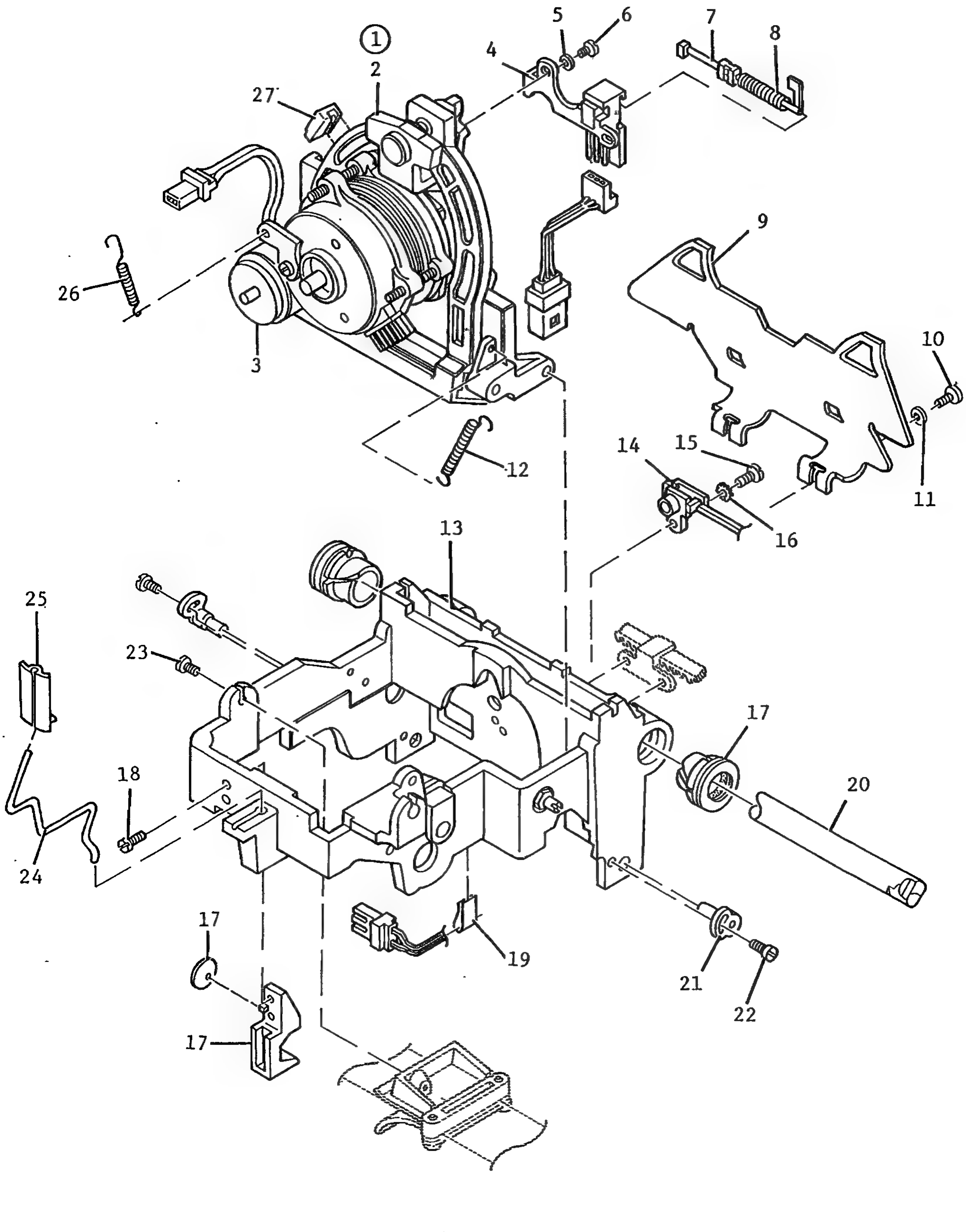


Figure 7. Carrier Asm-Mech 500

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
7-1	No PN	1	Carrier Asm
-2	1384061	1	Selection Plate Asm Includes Index -27 Also Order Index -21
-3	No PN	NP	• Solenoid,Print Hammer
-4	1337009	1	• Sensor,Homing
-5	No PN	AR	• Washer Part of Parts Packet 1384499
-6	No PN	AR	• Screw Part of Parts Packet 1384498
-7	1337801	1	• Flag,Homing Sensor
-8	No PN	1	• Spring,Homing Sensor Flag Part of Parts Packet 1384861
-9	1337907	1	Cardholder, Index 28 not required with new Cardholder.
-9A	1339778	1	• Muffler
-10	No PN	1	Screw Part of Parts Packet 1384498
-11	No PN	1	Washer Part of Parts Packet 1384499
-12	No PN	1	Spring Part of Parts Packet 1384497
-13	1384062	1	Frame,Carrier
-14	1337008	1	LED,Homing
-15	No PN	1	• Screw Part of Parts Packet 1384498
-16	No PN	1	• Washer Part of Parts Packet 1384499
-17	1384085	1	• Carrier,Bearing B/M Includes Index -18
-18	No PN	AR	• Screw Part of Parts Packet 1384498
-19	1342081	AR	• Clip,Homing LED
-20	1337071	1	Shaft,Carrier
-21	1384067	1	Eccentric B/M Includes Index -12, -22, and -26
-22	No PN	1	Screw Part of Parts Packet 1384498
-23	No PN	1	Screw Part of Parts Packet 1384498
-24	1342352	1	Post Indicator
-25	1342344	1	Indicator
-26	No PN	1	Spring Part of Parts Packet 1384497
-27	1317943	1	Damper,Print Hammer
-28	1362526	2	Clips,Cardholder Support (For Heavy Card Applications) (Not Shown In Figure)

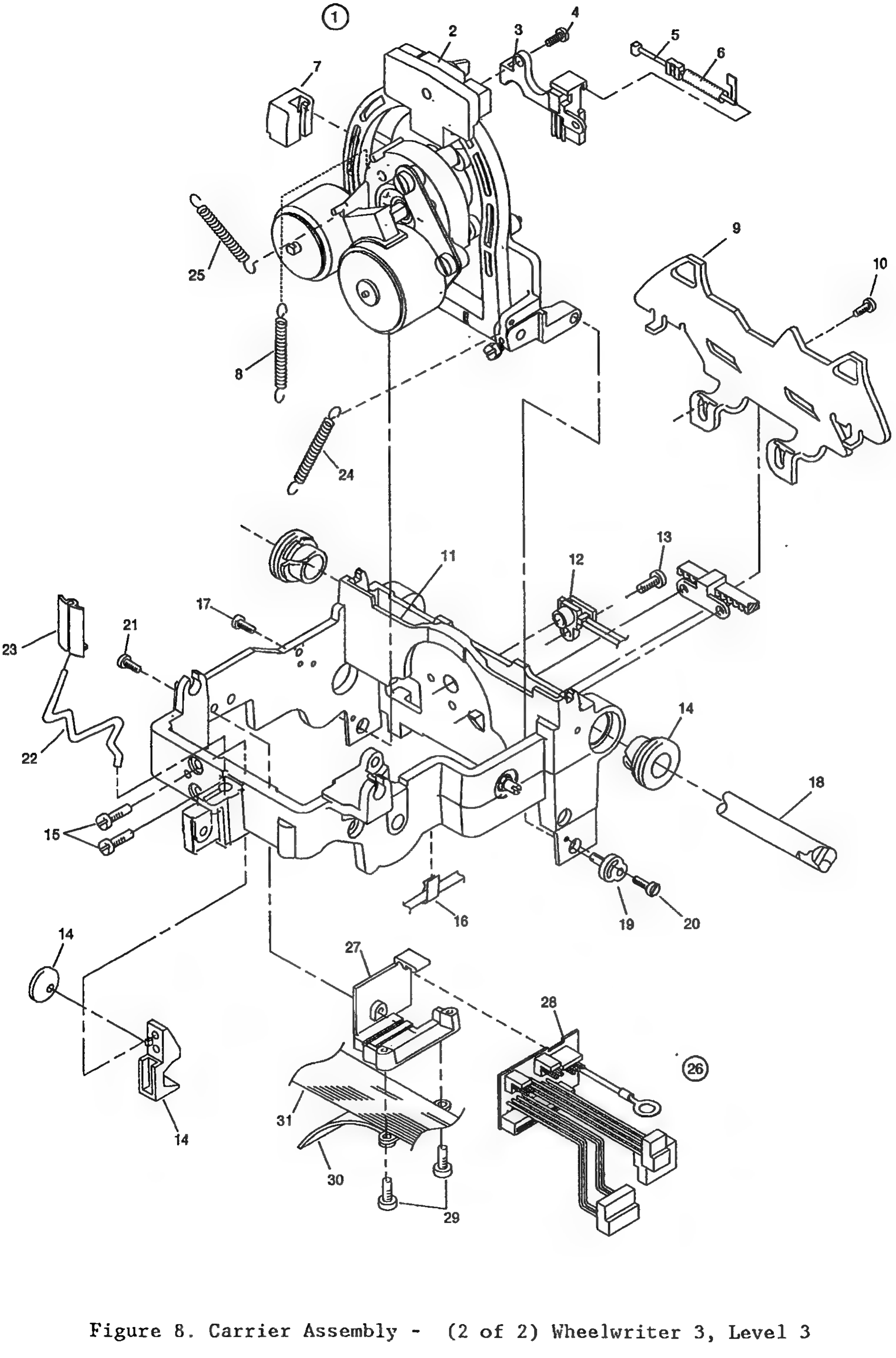


Figure 8. Carrier Assembly - (2 of 2) Wheelwriter 3, Level 3

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
8-1	No PN	1	Carrier Asm
-2	1384816	1	Plate Asm,Selection
-3	1337009	1	• Sensor,Homing
-4	No PN	1	•Screw,Homing Sensor Part of Parts Packet 1384498
-5	1337801	1	••Flag,Homing Sensor
-6	No PN	1	•Spring,Homing Sensor Flag Part of Parts Packet 1384861
-7	1317943	1	•Pad,Hammer Damper
-8	No PN	1	•Spring,Selection Motor Part of Parts Packet 1384861
-9	1337907	1	Cardholder
-9A	1339778	1	•Muffler (Not Shown)
-10	No PN	2	Screw,Cardholder Mtg Part of Parts Packet 1384498
-11	1384830	1	Frame,Carrier
-12	1430437	1	•LED Asm,Pitch/Homing
-13	No PN	1	•Screw,Homing LED Mtg Part of Parts Packet 1384498
-14	1384085	1	•Bearing,Carrier B/M
-15	No PN	2	•Screw,Front Carrier Bearing Part of Parts Packet 1384498
-16	1342081	3	•Clip,Homing LED Cable
-17	No PN	1	Screw,Part of Parts Packet 1384498
-18	1337071	1	Shaft,Carrier
-19	1384067	1	Eccentric B/M
-20	No PN	2	Screw,Eccentric Mtg Part of Parts Packet 1384498
-21	No PN	1	Screw,Carrier Bracket Part of Parts Packet 1384498
-22	1342352	1	Post,Indicator
-23	1342344	1	Indicator
-24	No PN	1	Spring, Part of Parts Packet 1384497
-25	No PN	1	Spring, Part of Parts Packet 1384497
-26	1384993	1	Carrier Cable Asm
-27	1430427	1	•Bracket,Carrier Cable Board
-28	1384812	1	•Carrier Cable Board
-29	No PN	2	•Screw,Carrier Cable Mtg Part of Parts Packet 1384498
-30	1342143	1	•Retainer, Carrier Cable
-31	1384990	1	•Cable,Carrier

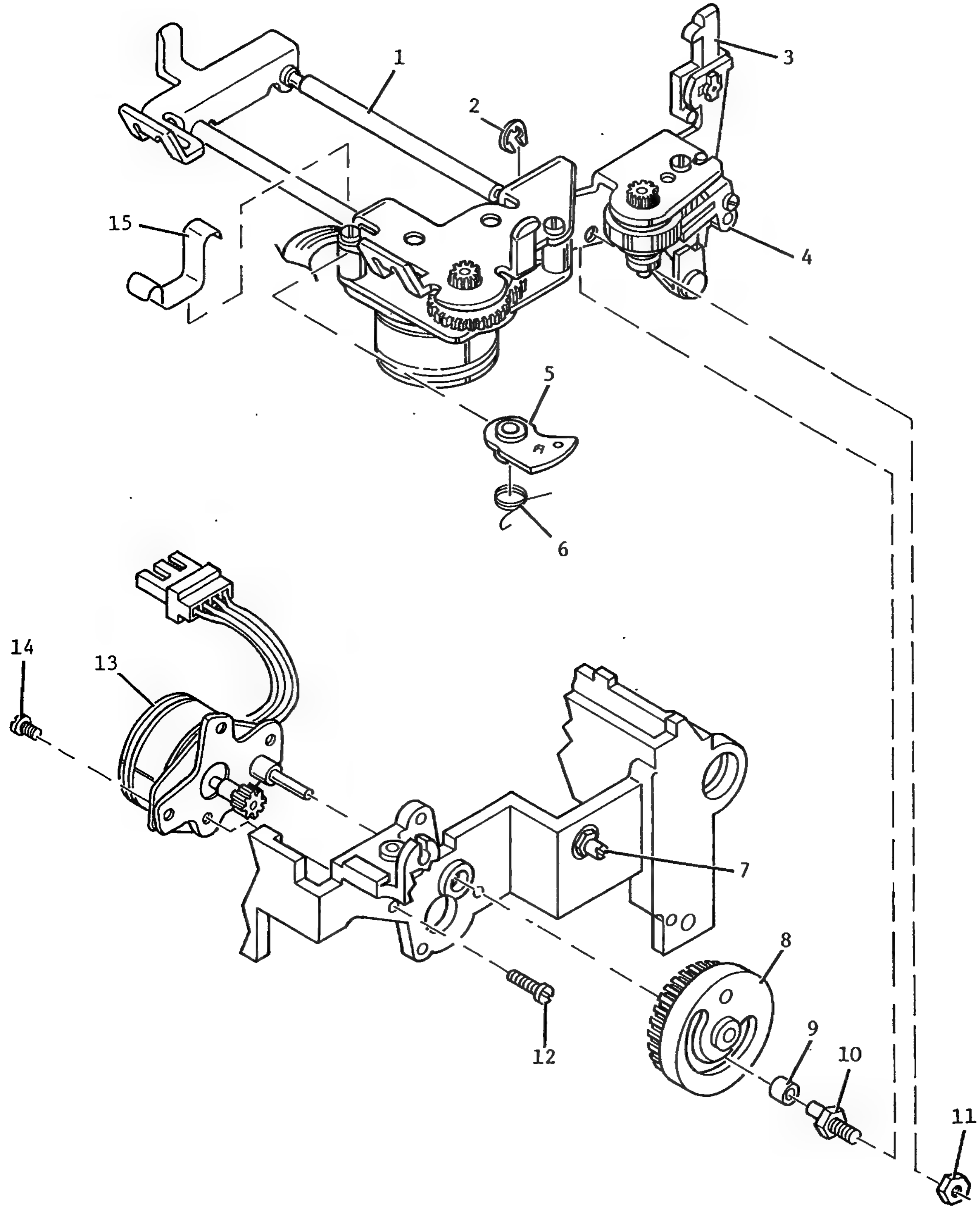


Figure 9. **Ribbon Asm-Mech 510**

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
9-1	1384072	1	Plate,Ribbon Asm
-2	No PN	1	• Retainer Part of Parts Packet 1384499
-3	1339347	1	• Latch,Ribbon
-4	No PN	NP	• Clutch Tape Feed
-5	No PN	NP	• Pawl,Backcheck
-6	No PN	NP	• Spring,Backcheck
-7	1339275	1	Stud,Correction
-8	1384073	1	Cam,Ribbon Asm
-9	No PN	NP	• Follower,Roller
-10	No PN	NP	• Eccentric,Ribbon Lift
-11	No PN	1	• Nut Part of Parts Packet 1384499
-12	No PN	2	• Screw Part of Parts Packet 1384498
-13	1384074	1	Motor,Ribbon Lift
-14	No PN	NP	• Screw Part of Parts Packet 1384498
-15	1277844	1	Spring,Ribbon Plate Load

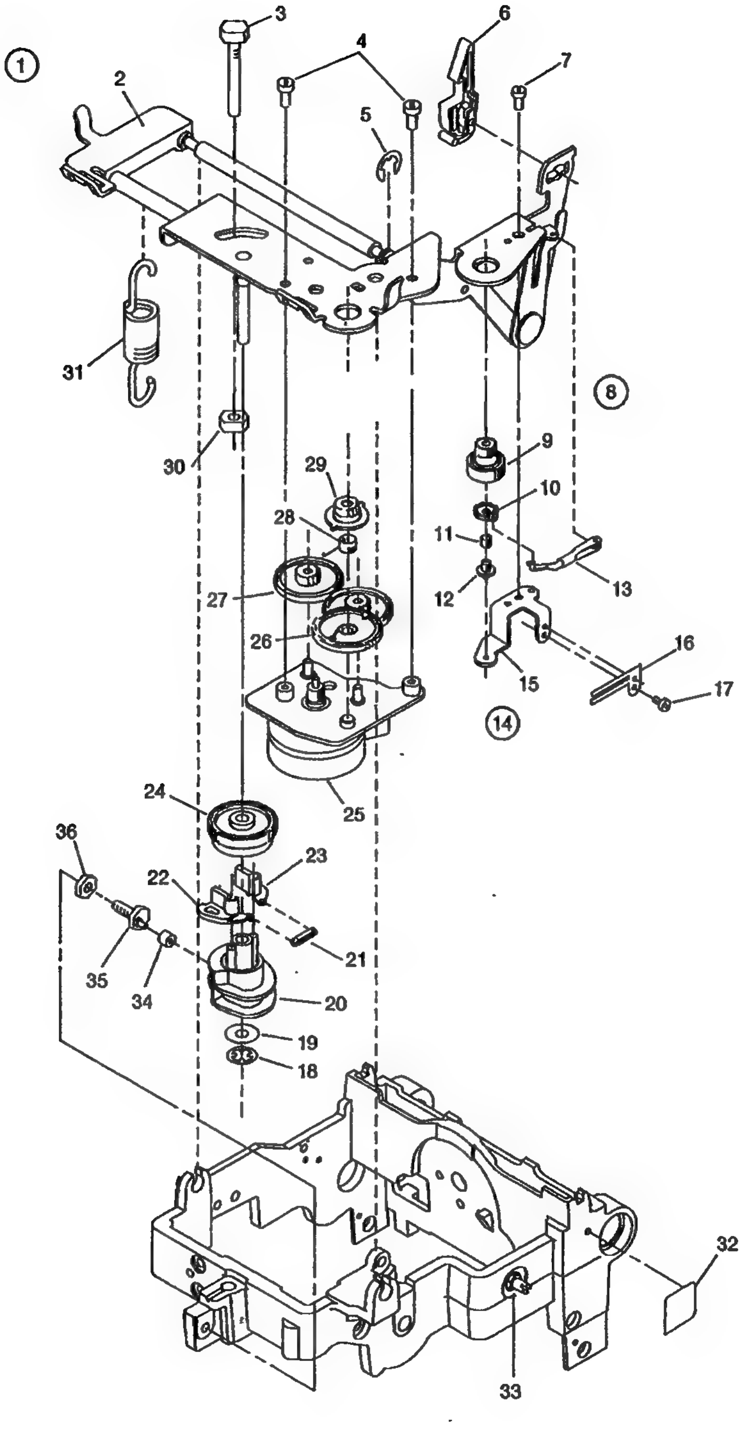


Figure 10. Ribbon Plate Assembly - (2 of 2) Wheelwriter 3, Level 3

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
10-1	1384817	1	Plate Asm,Ribbon
-2	1384819	1	•Plate,Ribbon
-3	1430397	1	•Stud,Knock Off
-4	No PN	2	•Screw,Ribbon Motor Mtg Part of Parts Packet 1384861
-5	No PN	1	Retainer,Ribbon Plate Pivot Part of Parts Packet 1384499
-6	1339347	1	•Latch,Ribbon Cartridge
-7	No PN	1	•Screw,Correction Bracket Mtg Part of Parts Packet 1384498
-8	1384818	1	•Ratchet Asm,Tape Feed
-9	No PN	1	••Gear,Tape Feed
-10	No PN	1	••Ratchet,Tape Feed
-11	No PN	1	••Spring,Tape Feed
-12	No PN	1	••Stud,Feed Ratchet
-13	1339011	1	•Link Asm,Correction
-14	1384820	1	•Bracket Asm,Correction
-15	1339292	1	••Bracket,Correction Feed
-16	1339291	1	••Spring,Correction Feed
-17	No Pn	1	••Screw,Correction Feed Part of Parts Packet 1384861
-18	1171121	1	•Retainer,Lift Cam Also Part of Parts Packet 1384861
-19	1622274	1	•Washer
-20	1430406	1	•Cam Asm,Ribbon Lift
-21	1073449	1	•Spring,Lift Pawl Also Part of Parts Packet 1384861
-22	1430410	1	•Pawl,Ribbon Lift
-23	1430411	1	•Pawl,Correction Lift
-24	1430409	1	•Gear,Lift Cam
-25	1384821	1	•Plate Asm,Ribbon Motor
-26	1430414	1	•Gear,Ribbon Feed
-27	1342106	2	•Gear, Ribbon Drive Idler
-28	1430412	1	•Spring, Bias
-29	1430413	1	•Follower,Ribbon Feed
-30	1622434	1	•Nut
-31	1430451	1	Spring,Ribbon Plate Load
-32	1430455	1	Damper
-33	1339275	1	Stud,Correction Feed
-34	1342146	1	Roller,Cam Follower
-35	1430405	1	Follower,Ribbon Lift Cam
-36	No PN	1	Nut,Cam Follower Part of Parts Packet 1384499

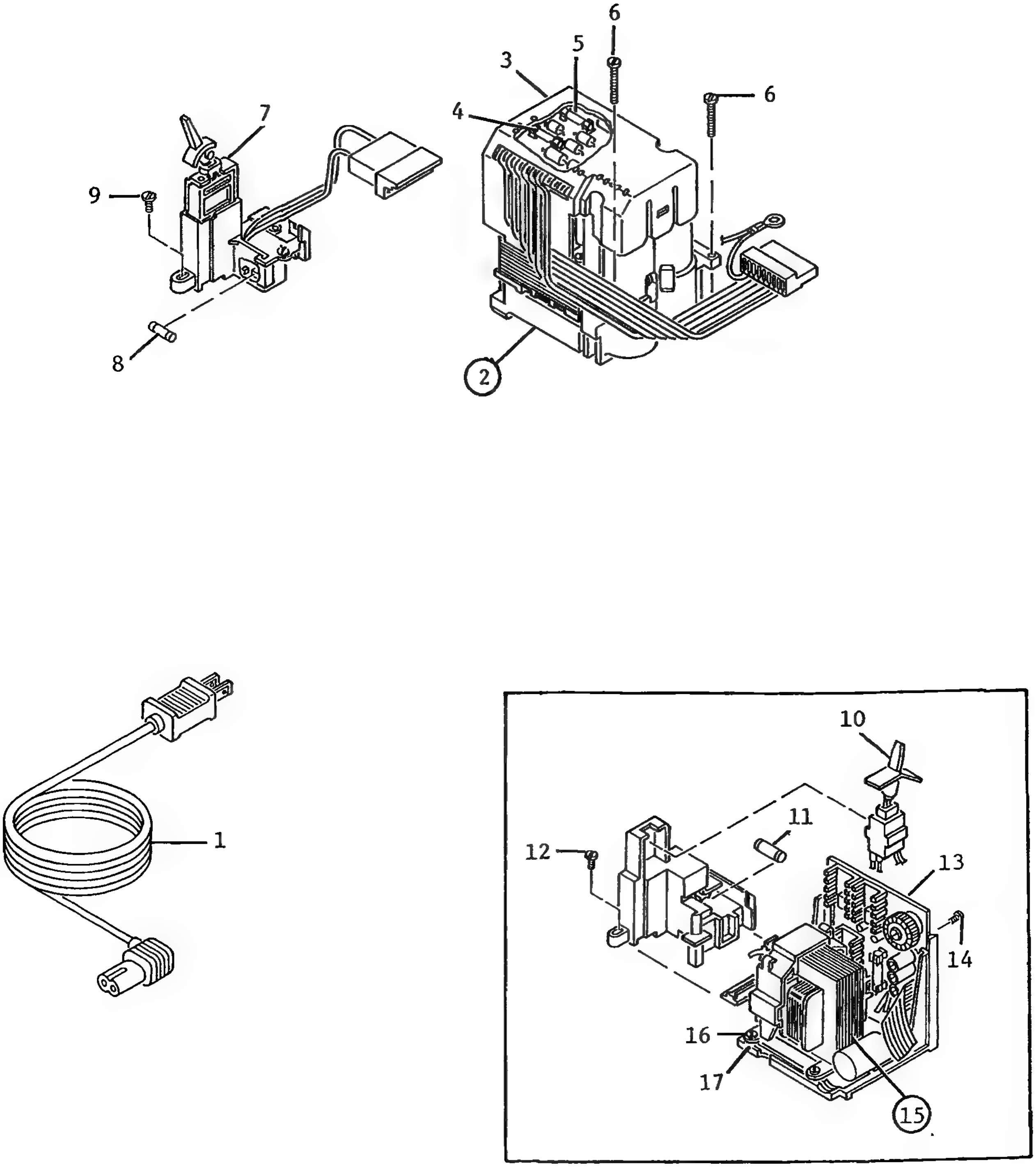


Figure 11. Power Supply Asm-Mech 600

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
11-1	1342033	1	Line Cord, 2 wire, U.S. and Canada For Specific Country Information See Chart A on page 7-39
-2	1384101	1	Power Supply Asm, (1,5) see page 7-2.
-2	1384375	1	Power Supply Asm, 100 V, 112.5 V, 127 V, 60 Hz, (2,6) see page 7-2.
-2	1384377	1	Power Supply Asm, 200 V, 230 V, 240 V, 50 Hz, (2,6) see page 7-2.
-2	1384376	1	Power Supply Asm, 220 V, 50 Hz, (2,6) see page 7-2.
-3	No PN	NP	• Cover,Power Supply, (1,2,5,6) see page 7-2.
-4	361755	1	• Fuse,2.5A, (1,2,5,6) see page 7-2.
-5	855231	1	• Fuse,2A, (1,2,5,6) see page 7-2.
-6	No PN	AR	Screw, (1,2,5,6) see page 7-2. Part of Parts Packet 1384498
-7	1342029	1	On/Off Switch Asm, 200 V ac and Above Includes Fuse, index -8 (2,6) see page 7-2.
-7	1342357	1	On/Off Switch Asm, 127 V ac and Below Includes Fuse, index -8 (1,5) see page 7-2.
-8	No PN	1	Fuse, Obsolete - Order Index 10
-9	No PN	AR	Screw, (1,2,5,6) see page 7-2. Part of Parts Packet 1384498
-10	1384281	1	On/Off Switch Asm, (3,4,7,8,9,10,11) see page 7-2.
-11	505077	1	Fuse,Primary 127 VAC And Below
-11	111264	1	Fuse, 200 Volts and Above (4,8,10) see page 7-2.
-12	No PN	2	Screw, (3,4,7,8,9,10,11) see page 7-2. With Plastic Bottom Cover - Part of Parts Packet 1384286 With Aluminum Bottom Cover - Part of Parts Packet 1384286
-13	1384284	1	Board,Power Supply (3,4,7,8,9,10,11) see page 7-2.
-14	No PN	AR	Screw Part of Parts Packet 1384286

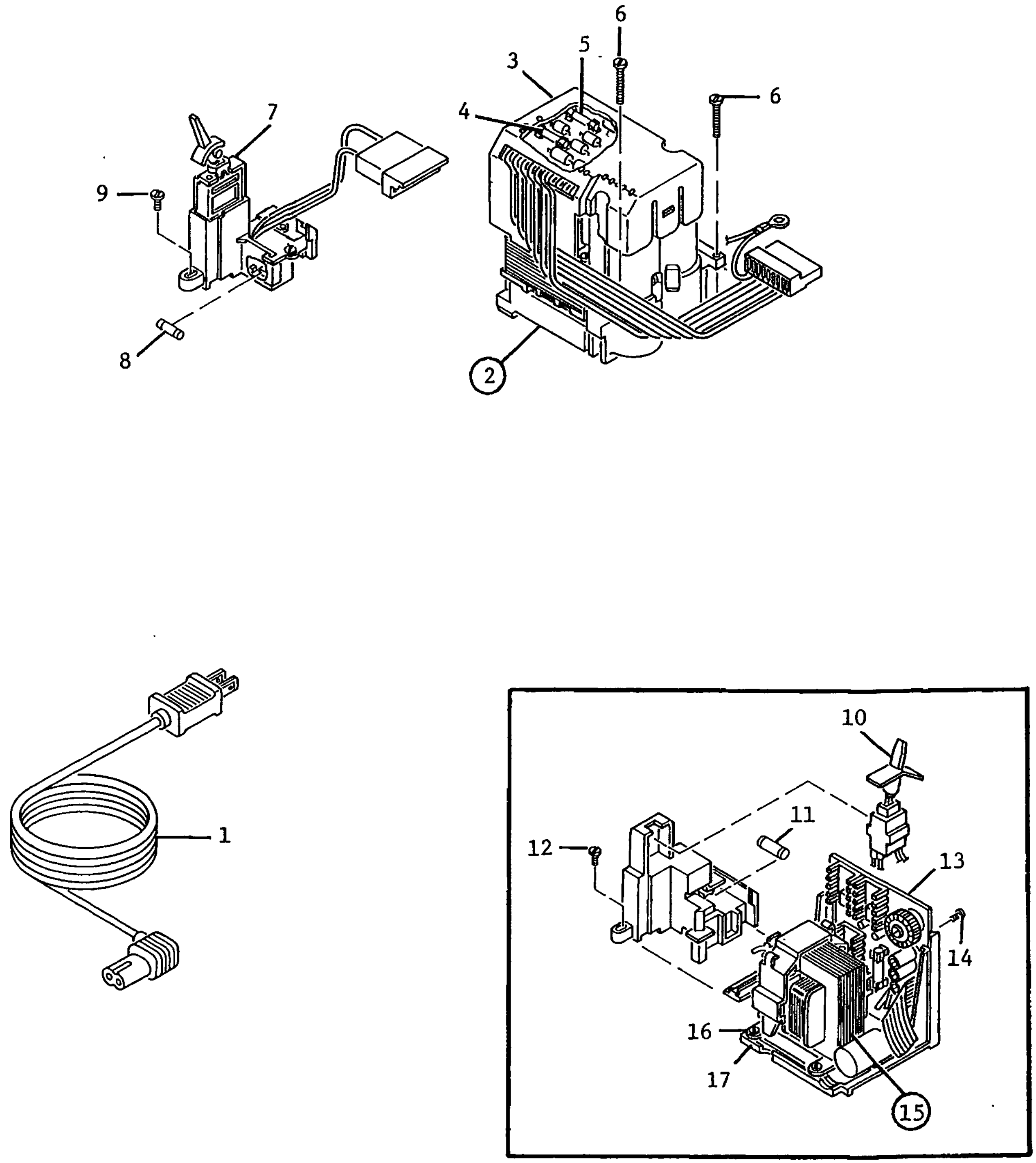


Figure 11. Power Supply Asm - Mech 600 (2 of 2)

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
11-15	1384285	1	Power Supply Asm, (3,7,9,11) see page 7-2.
-15	1384288	1	Power Supply Asm, 100 V, 50/60 Hz (4,8,10) see page 7-2.
-15	1384289	1	Power Supply Asm, 112.5 V, 50/60 Hz (4,8,10) see page 7-2.
-15	1384290	1	Power Supply Asm, 127 V, 50/60 Hz (4,8,10) see page 7-2.
-15	1384291	1	Power Supply Asm, 200 V, 50/60 Hz (4,8,10) see page 7-2.
-15	1384292	1	Power Supply Asm, 220 V, 50/60 Hz (4,8,10) see page 7-2.
-15	1384293	1	Power Supply Asm, 230 V, 50/60 Hz (4,8,10) see page 7-2.
-15	1384294	1	Power Supply Asm, 240 V, 50/60 Hz (4,8,10) see page 7-2.
-16	No PN	2	Screw, (3,4,7,8,9,10,11) see page 7-2. With Aluminum Bottom Cover - Part of Parts Packet 1384286 With Plastic Bottom Cover -(3,7,8,9,11) see page 7-2. Part of Parts Packet 1384286
-17	No PN	1	Ground Clip, Plastic Bottom Cover (3,7,8,9,11) see page 7-2. Part of Parts Packet 1384286 (Not Shown In Figure)

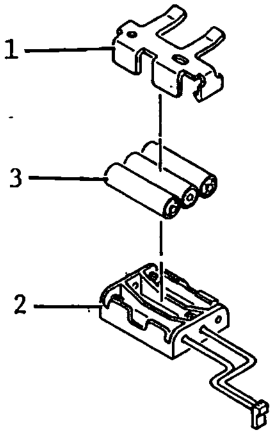


Figure 12. Battery Backup Asm - Mech 610

IGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
12-1	1342009	1	Holder, Battery Not Required For All Battery Packs
-2	1337966	1	Pack, Battery
-3	No PN	NP	Battery

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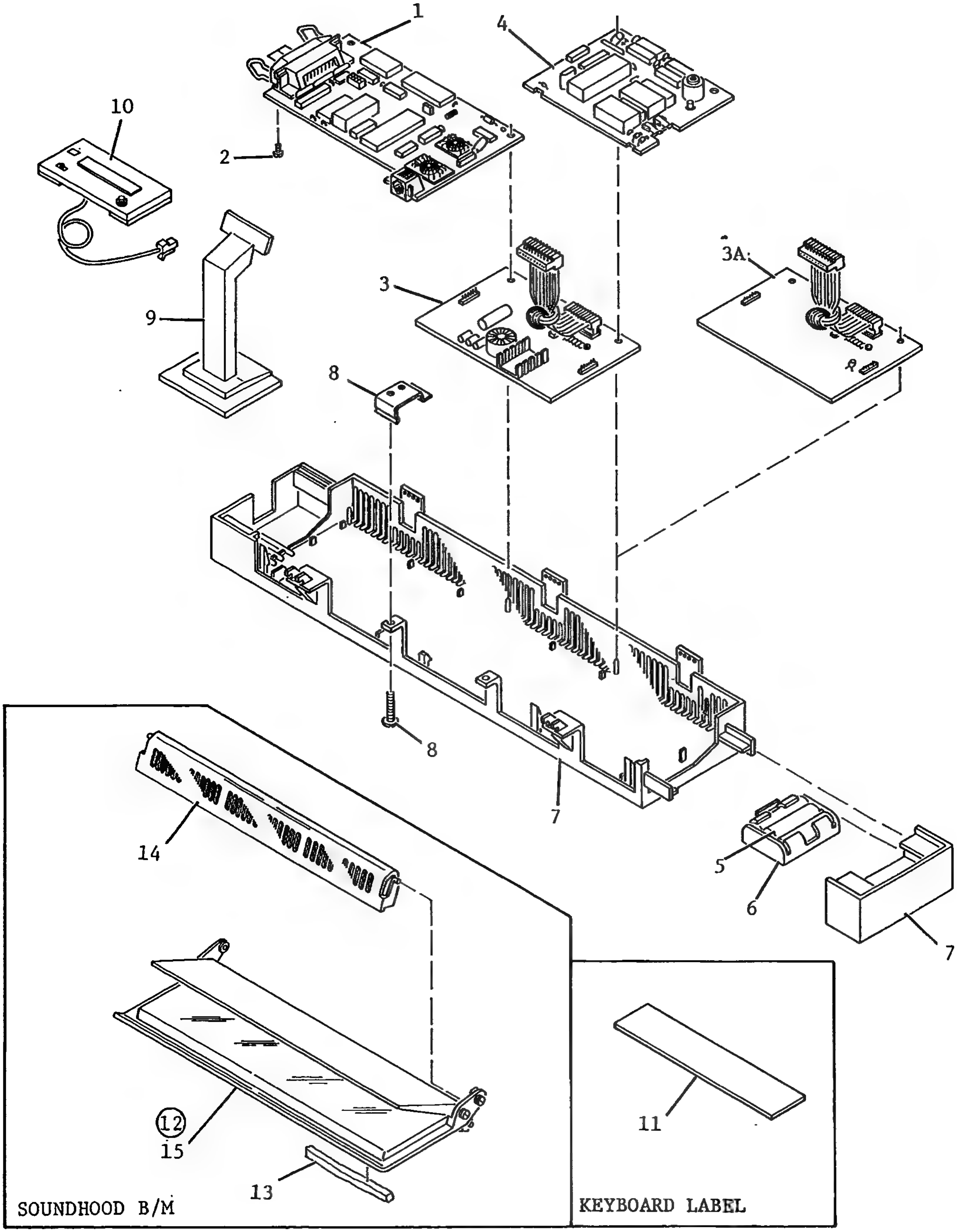

Figure 13. Options - Mech 350

FIGURE-INDEX	PART NUMBER	UNITS	DESCRIPTION
13-1	1317540	1	Board,Printer and Display, includes index -2 (5,6,7,8,9,10) see page 7-2.
-1	1317545	1	Board,Printer Option
-1	1317550	1	Board,Display Option Includes index -2 (5,6,7,8,9,10) see page 7-2.
-2	1317579	1	Common Wire Screw
-3	1384484	1	Board,Options Adaptor, (1,2,5,6) See page 7-2.
-3A	1384297	1	Board,Options Adaptor, (3,4,7,8,9,10,11) see page 7-2.
-4	1317520	1	Board,Spell Check US English
-4	1317522	1	Board,Spell Check UK/English
-4	1434800	1	Board,Spell Check German
-4	1434810	1	Board,Spell Check French
-4	1434820	1	Board,Spell Check Dutch
-4	1434830	1	Board,Spell Check Spanish
-4	1434840	1	Board,Spell Check Italian
-4	1434850	1	Board,Spell Check French/Canadian
-4	1434870	1	Board,Spell Check Danish
-5	No PN	3	•Battery
-6	1342989	1	•Battery Holder
-7	1384486	1	Cover Asm
-7	1384488	1	Cover Asm
-8	1342994	1	Anchor Kit, (2 screws and 2 clips)
-9	1342921	1	Display Stand
-10	1342880	1	Display, Includes index -9
-10A	1342889	1	Display Bracket (not shown)
-10B	1384789	1	Display mounting clip (not shown)
-11	1277872	1	Keyboard Label
-11	1277874	1	Keyboard Label, German
-11	1277875	1	Keyboard Label, Dutch
-11	1277876	1	Keyboard Label, French
-11	1277877	1	Keyboard Label, Italian
-11	1277872	1	Keyboard Label, Japanese
-11	1277879	1	Keyboard Label, Norwegian
-11	1277880	1	Keyboard Label, Finnish
-11	1277881	1	Keyboard Label, Danish
-11	1277885	1	Keyboard Label, Spanish/Latin America
-11	1277872	1	Keyboard Label, Portugese
-11	1277872	1	Keyboard Label, Greek
-11	1277872	1	Keyboard Label, Iceland Note: If the label you want is not listed, order 1277872.
-12	1342192	1	Soundhood B/M
-13	1342119	1	• Seal,Hood Asm
-14	1342128	1	• Table,Erase
-15	1342113	1	• Hood Asm
-16	1342116	1	• Hood Asm Hinge, right (not shown)
-17	1342117	1	• Hood Asm hinge, left (not shown)
-18	1341046	1	Wrap Plug (not shown)

Keybutton Groups

1392492	Spacebar, All Keyboards
1392473	Keybutton Group, U.S. WW3
1392474	Keybutton Group, CAN/BIL WW3
1392475	Keybutton Group, CAN/ENG WW3
1392476	Keybutton Group, U.S. WW5
1392477	Keybutton Group, CAN/BIL WW5
1392478	Keybutton Group, CAN/ENG WW5
1392479	Keybutton Group, U.S. WW6
1392480	Keybutton Group, CAN/BIL WW6
1392481	Keybutton Group, CAN/ENG WW6

Miscellaneous Parts

1384499	Retainer Parts Packet
1384498	Screw Parts Packet
1384497	Spring Parts Packet
1384286	Combined Parts Packet, Level 2
1384861	Combined Parts Packet, Level 3
7342769	Packaging

CHART A

COUNTRY	HOUSING ASM LED 6746	HOUSING ASM LED 6747, 6747-2	KEYBOARD ASSEMBLY 6746	KEYBOARD ASSEMBLY 6747
ANTIGUA, AFE	1337897	1337856	1384031	1384121
ARGENTINA, AFE	1342025	1342091	1384306	1384338
AUSTRALIA, AFE	1337897	1337856	1384031	1384121
AUSTRIA, EMEA	1342025	1342091	1384303	1384342
BAHAMAS, AFE	1337897	1337856	1384031	1384121
BAHRAIN, EMEA	1342200	1337856	1384309	1384348
BARBADOS, AFE	1337897	1337856	1384031	1384121
BELGIUM, EMEA	1342025	1342091	1384307	1384346
BOLIVIA, AFE	1342025	1342091	1384306	1384338
BULGARIA, EMEA	1342025	1342091	1384322	1384360
BURMUDAS, AFE	1337897	1337856	1384031	1384121
CANADA/BILINGUAL, AFE	1332025	1342091	1384305	1384344
CANADA/ENGLISH, AFE	1332025	1342091	1384304	1384343
CAYMAN ISLANDS, AFE	1337897	1337856	1384031	1384121
CHILE, AFE	1342025	1342091	1384306	1384338
COLOMBIA, AFE	1342025	1342091	1384306	1384338
COSTA RICA, AFE	1342025	1342091	1384306	1384338
CYPRUS, EMEA	1342025	1342091	1384326	1384364
CZECH-CZECH, EMEA	1342025	1342091	1384323	1384361
CZECH-SLOVAK, EMEA	1342025	1342091	1384324	1384362
DENMARK, EMEA	1342025	1342091	1384315	1384349
DOMINICAN REP., AFE	1342025	1342091	1384306	1384338
DUBAI, EMEA	1342200	1337856	1384309	1384348
EGYPT, EMEA	1342200	1337856	1384309	1384348
EL SALVADOR, AFE	1342025	1342091	1384306	1384338
EQUADOR, AFE	1342025	1342091	1384306	1384338
FINLAND, EMEA	1342025	1342091	1384311	1384351
FRANCE, EMEA	1342025	1342091	1384307	1384346
GERMANY (EAST), EMEA	1342025	1342091	1384325	1384363
GERMANY (WEST), EMEA	1342025	1342091	1384308	1384347
GREECE, EMEA	1342025	1342091	1384326	1384364
GUATEMALA, EFE	1342025	1342091	1384306	1384338
GUYANA, AFE	1337897	1337856	1384031	1384121
HAITI, AFE	1342025	1342091	1384304	1384343
HONDURAS, AFE	1342025	1342091	1384306	1384338
HONG KONG, AFE	1342200	1337856	1384319	1384358
HUNGARY, EMEA	1342025	1342091	1384327	1384365
ICELAND, EMEA	1342025	1342091	1384328	1384366
INDONESIA, AFE	1337897	1337856	1384031	1384121
IRELAND, EMEA	1342200	1337856	1384309	1384348
ISRAEL, EMEA	1342200	1337856	1384309	1384348
ITALY, EMEA	1342025	1342091	1384312	1384352
JAMAICA, AFE	1337897	1337856	1384031	1384121
JAPAN/ENGLISH, AFE	1342025	1342091	1384329	1384367
JAPAN/KATAKANA, AFE	1342025	1342091	1384330	1384368
JORDAN, EMEA	1342200	1337856	1384309	1384348

CHART A

COUNTRY	KEYBOARD ASSEMBLY 6747-2	LINE CORD	ELECTRICAL LABELS
ANTIGUA, AFE	1384647	1342033	1050389
ARGENTINA, AFE	1384693	1342034	1050390
AUSTRALIA, AFE	1384647	1342176	1050390
AUSTRIA, EMEA	1384648	1342034	1050394
BAHAMAS, AFE	1384647	1342033	1050389
BAHRAIN, EMEA	1384716	1342035	1050394
BARBADOS, AFE	1384647	1342033	1050389
BELGIUM, EMEA	1384651	1342034	1050394
BOLIVIA, AFE	1384693	1342033	1050389
BULGARIA, EMEA	1384662	1342034	1050394
BURMUDA, AFE	1384647	1342033	1050389
CANADA/BILINGUAL, AFE	1384650	1342033	1050383
CANADA/ENGLISH, AFE	1384649	1342033	1050383
CAYMAN ISLANDS, AFE	1384647	1342033	1050389
CHILE, AFE	1384693	1342034	1050390
COLOMBIA, AFE	1384670	1342033	1050389
COSTA RICA, AFE	1384679	1342033	1050389
CYPRUS, EMEA	1384674	1342035	1050395
CZECH-CZECH, EMEA	1384663	1342034	1050394
CZECH-SLOVAK, EMEA	1384664	1342033	1050394
DENMARK, EMEA	1384658	1342033	1050394
DOMINICAN REP., AFE	1384679	1342033	1050389
DUBAI, EMEA	1384716	1342035	1050394
EGYPT, EMEA	1384716	1342034	1050394
EL SALVADOR, AFE	1384679	1342033	1050389
EQUADOR, AFE	1384693	1342033	1050389
FINLAND, EMEA	1384654	1342034	1050394
FRANCE, EMEA	1384651	1342034	1050394
GERMANY (EAST), EMEA	1384673	1342034	1050394
GERMANY (WEST), EMEA	1384652	1342034	1050394
GREECE, EMEA	1384674	1342034	1050394
GUATEMALA, AFE	1384679	1342033	1050389
GUYANA, AFE	1384647	1342033	1050389
HAITI, AFE	1384649	1342033	1050389
HONDURAS, AFE	1384679	1342033	1050389
HONG KONG, AFE	1384676	1342035	1050389
HUNGARY, EMEA	1384665	1342034	1050394
ICELAND, EMEA	1384675	1342034	1050394
INDONESIA, AFE	1384678	1342034	1050390
IRELAND, EMEA	1384716	1342035	1050394
ISRAEL, EMEA	1384716	1342034	1050391
ITALY, EMEA	1384655	1342034	1050394
JAMAICA, AFE	1384647	1342033	1050389
JAPAN/ENGLISH, AFE	1384666	1342033	1050397
JAPAN/KATAKANA, AFE	1384667	1342033	1050397
JORDAN, EMEA	1384716	1342035	1050394

CHART A

COUNTRY	HOUSING ASM LED 6746	HOUSING ASM LED 6747, 6747-2	KEYBOARD ASSEMBLY 6746	KEYBOARD ASSEMBLY 6747
KOREA, AFE	1337897	1337856	1384031	1384121
KUWAIT, EMEA	1342200	1337856	1384309	1384348
LEBANON, EMEA	1342200	1337856	1384309	1384348
LIBERIA, AFE	1342200	1337856	1384309	1384348
MALAYSIA, AFE	1342200	1337856	1384309	1384348
MALTA, AFE	1342200	1337856	1384309	1384348
MEXICO, AFE	1342025	1342091	1384306	1384338
NETHERLANDS, EMEA	1342025	1342091	1384310	1384350
NETH. ANTILLES, AFE	1337897	1337856	1384031	1384121
NEW ZEALAND, AFE	1337897	1337856	1384031	1384121
NICARAGUA, AFE	1342025	1342091	1384306	1384338
NIGERIA, AFE	1342200	1337856	1384309	1384348
NORWAY, EMEA	1342025	1342091	1384316	1384355
OMAN, EMEA	1342200	1337856	1384309	1384348
PAKISTAN, EMEA	1342200	1337856	1384309	1384348
PANAMA, AFE	1342025	1342091	1384306	1384338
PARAGUAY, AFE	1342025	1342091	1384306	1384338
PERU, AFE	1342025	1342091	1384306	1384338
PHILIPPINES, AFE	1342025	1342091	1384306	1384338
POLAND, EMEA	1342025	1342091	1384331	1384369
PORTUGAL, EMEA	1342025	1342091	1384332	1384370
PUERTO RICO, AFE	1342025	1342091	1384306	1384338
QATAR, EMEA	1342200	1337856	1384309	1384348
RUMANIA, EMEA	1342025	1342091	1384333	1384371
SAUDI ARABIA, EMEA	1337897	1337856	1384331	1384121
SINGAPORE, AFE	1342200	1337856	1384309	1384348
SOUTH AFRICA, EMEA	1342025	1342091	1384317	1384356
SPAIN, EMEA	1342025	1342091	1384318	1384357
SRI LANKA, AFE	1342200	1337856	1384309	1384348
SURINAM, AFE	1337897	1337856	1384031	1384121
SWEDEN, EMEA	1342025	1342091	1384311	1384351
SWITZERLAND/FR., EMEA	1342025	1342091	1384313	1384353
SWITZERLAND/GER., EMEA	1342025	1342091	1384314	1384354
SYRIA, EMEA	1342200	1337856	1384309	1384348
TAIWAN, AFE	1337897	1337856	1384031	1384121
THAILAND, AFE	1337897	1337856	1384031	1384121
TRINIDAD, AFE	1337897	1337856	1384031	1384121
TURKEY, EMEA	1342025	1342091	1384334	1384372
UNITED ARAB EMIRATES, EMEA	1342200	1337856	1384309	1384348
UNITED KINGDOM, EMEA	1342200	1337856	1384309	1384348
URUGUAY, AFE	1342025	1342091	1384306	1384338
USSR, EMEA	1342025	1342091	1384335	1384373
VENEZUELA, AFE	1342025	1342091	1384306	1384338
YUGOSLAVIA, EMEA	1342025	1342091	1384336	1384374
ZAMBIA, EMEA	1342200	1337856	1384309	1384348
ZIMBABWE, EMEA	1342200	1337856	1384309	1384348

CHART A

COUNTRY	KEYBOARD ASSEMBLY 6747-2	LINE CORD	ELECTRICAL LABEL 6747-2
KOREA, AFE	1384647	1342033	1050389
KUWAIT, EMEA	1384716	1342035	1050395
LEBANON, EMEA	1384716	1342034	1050394
LIBERIA, AFE	1384716	1342033	1050391
MALAYSIA, AFE	1384716	1342035	1050397
MALTA, AFE	1384716	1342035	1050394
MEXICO, AFE	1384679	1342033	1050392
NETHERLANDS, EMEA	1384653	1342034	1050394
NETH. ANTILLES, AFE	1384647	1342033	1050389
NEW ZEALAND, AFE	1384647	1342176	1050397
NICARAGUA, AFE	1384679	1342033	1050389
NIGERIA, AFE	1384716	1342035	1050394
NORWAY, EMEA	1384659	1342034	1050394
OMAN, EMEA	1384716	1342035	1050394
PAKISTAN, EMEA	1384716	1342175	1050391
PANAMA, AFE	1384679	1342033	1050389
PARAGUAY, AFE	1384693	1342034	1050390
PERU, AFE	1384679	1342033	1050390
PHILIPPINES, AFE	1384679	1342033	1050390
POLAND, EMEA	1384668	1342034	1050394
PORTUGAL, EMEA	1384669	1342034	1050394
PUERTO RICO, AFE	1384679	1342033	1050385
QATAR, EMEA	1384716	1342035	1050395
RUMANIA, EMEA	1384670	1342034	1050394
SAUDI ARABIA, EMEA	1384647	1342035	1050391
SINGAPORE, AFE	1384716	1342035	1050397
SOUTH AFRICA, EMEA	1384660	1342175	1050394
SPAIN, EMEA	1384661	1342034	1050394
SRI LANKA, AFE	1384716	1342035	1050397
SURINAM, AFE	1384647	1342033	1050089
SWEDEN, EMEA	1384654	1342034	1050400
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